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FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the improvement of the Practice,

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

> And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." *Swift.*

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THE

FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the improvement of the Practice,

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

Vol. IV. MAY, 1836. No. 1.

And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." *Swift.*

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THE FARMERS' REGISTER.

VOL. IV. MAY, 1836. No. 1.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

ON THE IMPORTANCE OF FARMERS GIVING PERSONAL ATTENTION AND LABOR TO THEIR FARMS.

To the Editor of the Farmers' Register.

I have been a subscriber to your agricultural work from its commencement, and yet never attempted to aid you in your labors, notwithstanding the gentle rebuke you gave me, and the invitation to contribute my mite to the information which is due from every man of experience, who is engaged in the cultivation of the earth. The truth is, that I entered the field of agriculture nearly 45 years ago, with small means, and necessity drove me to hard labor, with the very few slaves I possessed, and left me no time to keep a journal of my little operations; and my family increased faster than my profits, so that when the scale of my operations extended, so as to take me away from manual labor, I found even less time to commit to paper the results of such experiments as grew out of my pursuits; and I have no recourse now to any thing but a defective memory, to enable me to present any thing useful to the present generation. Indeed, Mr. Editor, the course of business is very much changed since I began my operations. At that day, there was a great deal of land to open, and it was not thought disgraceful to take hold of an axe and set a good example to the negroes—and that gave a habit of labor which led on the young to follow it up through the year at any sort of work that came in the way. I pursued this course myself for seven years, till the investments of my profits put it out of my power to do any thing more than lay out the plan of operation, and see that others did their duty in the execution. And here let me remark upon another very important change that has been brought about: That very useful class of men called overseers, in a slave-holding country, were employed upon a share of the crop; and it was upon the following principle:—A young man expected to make his living in this way, and had neither land nor labor except that of his own body and mind.—The man who had land and negroes from which he wished to derive profit, entered into a sort of partnership with the young man, that he would furnish the land and a certain number of laborers—we will suppose seven. It was understood that the young man was to work regularly with these negroes, and at the end of the year was to have the profits of his own labor, which was the eighth part, leaving the profit of the labor of the negroes to the master. Thus the young man received his full share for his labour, and paid nothing for the land he cultivated; besides which, he had his house, provision and fuel for himself, and his wife and children, if he had any; while he was earning a reputation, (if he was good for any thing,) which, in the end, would be a fortune to him. And let me tell you, sir, that this training gave him a knowledge of what could be done; it gave him strength of body and mind, and habits of industry, which would generally stick by him through life. When after beginning with a small number of hands—three, four, five or more, he became qualified to manage too many to justify his laboring in person, his profits increased to a share and a half, two shares, or even more, till at length he was enabled to establish himself; and in process of time, perhaps employed young men to begin as he had done; and his experience qualified him to be a judge of others.

I reckon, sir, you begin to think you had better have let me off, than have your Register filled with what I have no doubt will appear to many of your readers useless stuff. But when I tell you I ascribe the little success I have had in providing the means of raising a large family, to the seven years of hard labor I endured, I trust I shall be excused for endeavoring, in this way, to encourage the young men of the present day to conform, in some degree, at least, to the plan of life here laid down.

I come now to the change adverted to in the former part of this letter.—After I had added to my business, by the purchase of another farm, and had had several valuable agents, being in want of an overseer, a young man was recommended to me. While in conversation with him, I asked if he ever worked with his people? He said—Oh, no! he considered it disgraceful to work with negroes. I told him I had done it seven years, and never thought I had been disgraced by it. I told him I never bound an overseer in writing to work, because if he required that, I did not expect much from him: but I wanted to know his habits. You must know, that by this time, our country was becoming more of a farming country than it had been, in consequence of the increase of arable surface, by clearing, as well as the exhaustion of some of the fields, which caused the owners of the soil to turn their attention more to improvement, which conflicted with the immediate interest of the overseer, by its prospective character. This brought about the habit of giving standing wages—broke up the co-partnership, and took away the interest of the overseer, in the fruits of his year's work. You know, sir, without my telling you, that the way to insure a man's fidelity to his trust, is to make it his interest to be faithful. Do not understand me as joining in the general denunciation of overseers, as the most faithless men in the world. Far from it. I have been fortunate in finding among them, as much, or more fidelity, than in other classes of society. But they are men, and consequently, are liable to the frailties of men; and when we employ one that cannot overcome selfish motives, and attend to the interest of his employer, the mischief is incalculable, particularly as the time approaches when he is to leave the business he is engaged in, and receive the same wages as if he had done his duty.

The intention of the foregoing remarks, is to show the great imporrance—indeed, the absolute necessity of more personal attention from the owners of the land, and labor. And this necessity is rendered more imperious by the great and sudden rise in the price of labor. We have interposed between the soil cultivated, and the labor employed in its cultivation, an agent who has no interest in either, except that which arises from his character and standing in his occupation. And although this, in many instances, operates as a powerful stimulus, and when accompanied with sound moral principle, is sufficient for the accomplishment of our objects, both as to immediate profit and improvement of soil, which is ultimate. Yet, in very many cases, these are wanting; and great loss, perhaps in the end ruin, is the inevitable consequence. Why, then, cannot those, who have but one farm, and who are young, "*take hold*," and be farmers indeed? Among their laborers, they may find here and there, some who are faithful, and have sufficient intelligence to follow the directions of the master; and when they possess these qualifications, will do so with an eye singly to the wishes and interest of the master. Besides the principal, he can have subordinate agents, particularly at the head of his ploughmen. The master can, by this mode, give more encouragement to his slaves. He can understand their characters—can reward and punish with more judgment. In a word, he can feel more responsibility, and suffer less pain under that responsibility, than when he must depend upon another. For if any thing disagreeable occurs between the overseer and the slave, he cannot positively know the merits of the question; and if he leans too much to the tale of the slave, he overthrows the authority of the overseer. On the contrary, if he turns a deaf ear to the complaints of the slave, he incurs the risk of unnecessary severity. Let me not be understood to convey the idea, that this class of men can be dispensed with: they must always be in demand. There are too many cases in which they cannot be dispensed with; and in a slave-holding country, there is no more useful and necessary class of men. Yet, many salutary consequences will flow from the immediate agency of the owner of the soil. He will set an example of more vigilance in these intermediate agents. He will put out of employment those who do not, like him, consult the ultimate interest of the farm, as well as the immediate profits thereof, in which he is more intimately concerned. He will reason upon causes and effects, upon his own operations and experiments, which is not to be looked for from those who are tied down to the experience of those who have gone before them. Consequently, more reliance is to be placed upon the results of his own observation, accompanied by the reasoning of his own mind, than upon facts detailed by others, who may, for want of this reasoning, lead him into erroneous conclusions from their facts. He will often find occasions during the year, when he can devote more attention to the interest of the farm, than can be expected from one whose immediate interest does not prompt him to watch these little intervals of time, of what might be called leisure; though in truth, this leisure might be employed in consulting the benefit of the crop. In short, Mr. Editor, there is nothing, but the ownership of the soil, which can inspire that lively concern in its improvement, which will enable the manager of it to take advantage of all circumstances and occasions to consult its future productiveness, when by doing so there is some little conflict with immediate profit, though not sufficient to induce the judicious farmer to neglect it. And this reasoning would apply as well to the present owner, as the man who is placed between the immediate and ultimate profit of the land and labor, if their situations were reversed.

The communication above, was written more than twelve months ago. I declined to send it, because there is too much of egotism in it. Having come across it to-day, in turning over my papers, and shown it to a friend who is with me, he has prevailed upon me to send it to you. If you think it worthy of a place in your valuable collection, publish it. I must be allowed, however, to depart from that, which, in most cases, seems to be adopted by your correspondents, of signing my own proper name to it. If you decline to insert it in your journal, be assured you will give no offence to one who is less of a farmer than

A PLANTER.

ON PREPARING AND MANAGING TOBACCO PLANT BEDS—AND SOME REMARKS ON THE TOBACCO CROP.

To the Editor of the Farmers' Register.

It is not my purpose to inquire into the consequences which will flow from the extensive cultivation of tobacco in the state of Virginia. I presume, however, it must be manifest to all reflecting men, that it will necessarily have a very injurious effect upon the system of farming, which a few years ago was carried on with so much spirit, and gave such fair indications of resuscitation to our exhausted country. The quantity of forest land, so much reduced already as to drive many to the west, will be still farther diminished, by the efforts to produce the kind of tobacco for which the manufacturers give such encouraging prices, as well as by the amount of wood used in burning plant land, and curing tobacco made on the old ground. My present object will be to point out the means of saving fuel in burning plant land; and as experience is the best guide, I may perhaps succeed better in elucidating the subject, by giving a history of my practice. In the spring of 1820, before the grass went to seed, I cut down a piece of sapling land at the head of a bottom, raked off the leaves, made a fence around it with the poles that were cut from it, and penned my cattle on it till it was very rich. (It was high up the bottom, and very indifferent plant land before I cow-penned it.) The next winter, when I designed to burn it, it continued so wet that I was compelled to give it up, notwithstanding I had cut a ditch around it. I covered half of it (thirty-five yards by seventeen) with brush (after laying skids about four feet apart) about two or three feet deep, and laid the poles of which the fence was made, all over it, intending to burn it the next winter. But it did not occur to me, that after the winter set in, it would never dry any more until the summer. So I missed the chance again. I added a little brush and wood in those spots where it appeared to be wanting. The next fall, about the latter end of October or first of November, I put fire into it, when, by the dampness of every thing around, it was safe to do so. The heat operating at once all over the patch, was intense—so as to drive every body away to the distance of at least fifty yards. I suppose it would be safe to say, that not more than a third of the fuel was used, which is employed in the customary way of making a log fire, and hauling it with hooks as it burns down. Besides that this most distressing and unwholesome operation, of all that we perform, is avoided—while the burning is a great deal more uniform. Not a spot could be found within the outer edges, which was not equally burned with the rest; and every spot yielded its fair proportion of plants. The first time it was drawn, I planted my manured lot of 40.000 hills, with plants as large as a man's hand, and afterwards,my overseers on two adjoining plantations, drew for their old ground, at least 100.000 more, of equal size. I doubt whether the same amount of land, taking the average, burned in the ordinary method, would yield more than one-third of the plants of similar size, by the period of the planting season—although, perhaps, three times the quantity of wood was used in burning. I am aware that few men could look forward far enough to bestow the necessary labor to give the same result—particularly, where an overseer is consulted, who is naturally unwilling to bestow so much labor, perhaps, for some one who is to follow him. But although the same amount of benefit may not be derived by making use of the land thus treated, at an earlier period—yet great advantage accrues even by allowing it to remain till the ensuing fall. The fall twelvemonth is now the time I generally select for making use of it. Another great advantage attends this practice. As soon as it is burnt, (say in November,) it is prepared exactly as if it was to be sown immediately. So that if the weather is untoward at the time you would wish to sow it, you can sow upon frozen ground. If it is suitable, you can give it a light raking. Nothing then, can prevent your sowing in as good time as you think proper.

Although I consider cow-penning the best mode of manuring for plants; yet it will not do to confine ourselves to it. The winter is my time for packing brush and wood on plant land for the fall twelve months after. I select a spot in the woods—rake it clean—lay skids about four inches diameter, and about four feet apart—lay on the brush across them, going backwards with the layers till it is all covered—then, beginning at the buts, travel on the wood which is laid across them and mauled small as is convenient, till all is covered. But before the brush is put on, cover it with manure according to the natural strength of the land. The manure must have no grass seed in it. Stable manure, when the horses are fed on fodder, is very good. Those who have tobacco stalks, will find this a valuable mode of using them. In some instances, however, (particularly where the land is rich,) I pack it without manuring—the covering itself, and the gradual decay of the twigs and bark, impart fertility to the soil, and lighten it up, so as to make it favorable to the growth of plants.

In a slave-holding country, suited to the growth of corn, wheat, and tobacco, this mixed crop furnishes the most regular and profitable employment for a set of human beings, whom the master is bound by every motive, to maintain all the year: while, in those countries cultivated by free laborers, the farmer gives employment to them when required; and when he has accomplished the business of the different seasons, leaves to them the care of their own families. This circumstance, added to the present high price of slave labor, and the high price of tobacco, consequent thereon, not only leads many to engage more extensively in its culture, but many others to adopt it, who had not done so before. I may therefore, as the season advances, for the information of this last class, trouble you with some further observations upon its management, which may be useless to those who are experienced, and as well or better acquainted with it than I am.

A PLANTER.

[The writer of the two foregoing communications has not even trusted *us* with his name—but we can scarcely err in ascribing them to the pen of a gentleman whose name would stand, as authority, among the highest—and most deservedly so, on account of his long and remarkably successful course as a cultivator of the soil, as well as for his well earned elevated station in society. His future communications will be especially welcome, as presenting the facts and opinions of a truly practical tiller of the earth.

In addition to his promised observations on tobacco culture, we shall be pleased if our correspondent will furnish all the details of the usual most laborious and costly operation of burning patches for tobacco plants, and their other preparation and management. No other writer in this journal has fully described this branch of tobacco culture—and the description would be curious and interesting to those who know nothing of it, and will be so to all readers hereafter, when the entire destruction of the present covering of growing wood shall necessarily put an end to the present mode of preparing plant beds. Without such details of the usual process, strangers will find it difficult to believe that the plan recommended by our correspondent, apparently so costly in labor, and wasteful of fuel and manure, can be (as doubtless it is,) more economical in all these respects, than the usual mode.]

CONDITION OF THE DESCENDANTS OF A NUMBER OF EMANCIPATED SLAVES, IN PRINCE EDWARD COUNTY.

To the Editor of the Farmers' Register.

Richmond, March 22d, 1833.

You expressed a wish (page — vol. III,) to obtain information in relation to the history of the emancipated people of color in Prince Edward; I presume those emancipated by the late Richard Randolph more especially.

More than twenty-five years ago, I think, they were liberated, at which time they numbered about one hundred, and were settled upon small parcels of land, of perhaps 10 to twenty-five acres, to each family. As long as the habits of industry, which they had acquired while slaves, lasted, they continued to increase in numbers, and lived in some degree of comfort—but as soon as this was lost, and most of those who had been many years in slavery either died, or became old and infirm, and a new race, raised in idleness and vice, sprang up, they began not only to be idle and vicious, but to diminish instead of increasing, and have continued to diminish in numbers very regularly every year—and that too, without emigration; for they have almost without exception, remained together in the same situation as at first placed, to this day. Idleness, poverty, and dissipation, are the agents which continue to diminish their numbers, and to render them wretched in the extreme, as well as a great pest, and heavy tax upon the neighborhood in which they live. There is so little of industry, and so much dissipation amongst them, that it is impossible that the females can rear their families of children—and the consequence is, that they prostitute themselves, and consequently, have few children—and the operation of time, profligacy and disease, more than keep pace with any increase among them. Whilst they are a very great pest and heavy tax upon the community, it is most obvious, they themselves are infinitely worsted by the exchange from slavery to liberty—if, indeed, their condition deserves that name.

JAMES MADISON.

[The facts stated in the foregoing communication are both interesting and important. We are greatly indebted to our esteemed and well informed correspondent for his compliance with our request, and have only to regret that he did not enter more into the details of so fair and decisive a trial of the effects of negro emancipation, made under the most favorable circumstances. In this case, the slaves who were emancipated had been trained to labor—they were abundantly provided with fixed farming capital—and they had, and their descendants still have, in addition, a continual demand for their labor, in the boating on the Appomattox—an employment which they prefer to all others, because it is the nearest to idleness. Yet with every advantage, and through a long course of time, their prosperity and even their numbers have been diminishing, and their condition has gradually become worse. A more full experiment cannot be adduced, nor a more decisive result.]

For the Farmers' Register.

THE HACKBERRY PROPOSED FOR LIVE HEDGES.

I doubt much whether a live fence can be made *proof* against hogs. At any rate, it is not probable that fences of this description will be much attempted in Virginia for a long time to come. I have long thought that the hackberry tree promised to answer the purpose better than any other that I have seen. It will grow to a very large tree, under favorable circumstances—but when browsed down by stock, it makes the most dense and unyielding shrub I have ever seen. I know several bushes of it through which it would be difficult for a sparrow to creep. About twenty years ago, I sowed a small lot with the berries; they vegetated very well—but were ploughed up, through mistake, by a servant, in my absence. There are no bearing trees in my immediate neighborhood: and though anxious to try again, I have been unable to procure fresh berries. Nature has so formed such seed, that they will never vegetate after once drying; were it otherwise, the power of man could not prevent their taking possession of the earth. This is the case with the seed of the hawthorn, the rose, and in some measure, with the grapevine and the apple tree.

M.

CLOVER AND GYPSUM NOT SUFFICIENT FOR DURABLE IMPROVEMENT. VALUE OF EASTERN SHORE LANDS.

To the Editor of the Farmers' Register.

Eastern Shore of Maryland,
February 15th, 1836.

I regret to find by your address to readers and correspondents, in your No. for February, that you have cause to complain of the want of co-operation. You would find it difficult by your own exclusive efforts, to keep such a work as yours in successful operation. I owe something more than my annual subscription to the Register, and desire to make suitable returns. I may aid in filling your columns, but I fear you will find my contributions of but little value.

Some of your correspondents, seem to entertain the opinion that clover, in conjunction with gypsum, is a means of solid and permanent improvements. My experience has led me to a different conclusion. Many years ago, I purchased a small farm—the soil had been originally fertile, but reduced in its early cultivation by tobacco—afterwards, by the improvident three-field system. This farm was cultivated by my directions—my vocation not permitting much of my personal attetion. I had it divided into five fields, one cultivated in corn, two in wheat, one of those I sowed in clover, and plastered the first and second year, after gathering the wheat. The growth of clover was rich and abundant. My clover fallow produced crops of wheat far beyond expectations. I expected progressive improvement, and the means to be so easy that I paid but little attention to collecting putrescent manures. I succeeded well for two rounds; but my crops of wheat greatly diminished in the third—though clover still continued to flourish, and Indian corn grew well. This system had been an innovation in the neighborhood. I had been a little proud of success, but I deemed it unwise to pursue it at a loss. I abandoned clover and plaster, divided the farm into five fields, and sought improvement by marsh mud and putrescent manures. This farm now produces good crops of wheat and corn—though not so abundant as under the first impulse of clover and plaster. Whether gypsum be a stimulant, or an alterative, I do not know; but I am satisfied it may be pushed too far—and like shell marl, does mischief, by an injudicious application. I commenced marling this farm last fall, and intend, with caution, to try gypsum upon my marled grounds.

For the last four weeks the winter has been rigorous. Crops of wheat have afforded but a small supply of straw, and till the grass springs, the cattle must suffer. Duty and interest inculcate that every creature over which we exercise dominion ought to be supplied with food suited to their wants. My cattle generally get on tolerably well, till the warm days in February, with corn cops and wheat straw; they then seem to loathe this food. Salt provision is said to be the best diet for a laboring man—but if he is constantly kept on it, without a plentiful supply of bread, he will sicken and die. If our winters were as long as they are to the north, with an abundance of our provender, (corn-caps and wheat straw,) I doubt whether our cattle would get through them. The late William Cobbett recommended strongly, ruta baga for cattle; but his agricultural statements were so exaggerated, and all his notions so strange and unsettled, that I could give them no confidence. Last year, for the first time, I grew a small quantity; my milch cows eat it with avidity, and indicate, both by their milk and appearance, an improved condition. One acre well improved and cultivated, will produce from three to five hundred bushels, equal to ten tons. For the future, I shall endeavor to grow as much ruta baga as will serve for a change of food from the middle of February till my cattle find more palatable sustenance in my clover fields.

I greatly desire to see the tide of emigration to the west arrested. Large sources of improvement have been recently opened in our country, and more are still from day to day disclosed. Men of industry, with a moderate capital, might make a more eligible location here, than in the far west. It is true that richer lands can be purchased on the frontier at a cheaper rate—but when building, clearing, and inclosing come to be added, I do not doubt, that an old exhausted farm can be purchased, marled, and brought to a point of profitable product for less money. I offer as proof, a farm now held in Kent county by Captain Vickers of Baltimore. This gentleman having acquired an independent fortune by trade, with a laudable attachment for his native soil, purchased the farm on which his father had lived: the scene of his early sports and joys. It came into his hands exhausted and impoverished He has improved it in an expensive way by ashes and other manures from Baltimore, and I understand it affords him a clear profit of twelve per cent. on the whole cost—yielding from twenty-five to thirty bushels of wheat to the acre. We have thousands of acres on the Eastern Shore, which do not now repay more than the expenses of cultivation, which, with the resources of our own lands, might be brought to a point of profitable product. Our insulated situation invites few persons from abroad. We sometimes see a gentleman merchant, or his collecting agent, on the public road, which passes through the peninsula, from north to south, on our worst lands; and the bird's-eye view of our Professor Ducatel was not calculated to enlighten on this subject—I do not mean to disparage our Professor—I have no doubt he is a good chemist. He was in pursuit of marl, and prosecuted his search with diligence; but his anterior habits and pursuits did not greatly qualify him to judge of the capabilities of our country. A few years ago I travelled in the stage with the late senator Johnson of Louisania, and we conversed about agriculture. He made particular inquiries as to the product of our lands and the expense of cultivation. I told him that a well improved farm on the Eastern Shore would produce twenty bnshels of wheat and forty of Indian corn to the acre, and made a rough estimate of the expense of cultivation. He said the gross product of their cotton and sugar plantations were greater, but when the difference of expense of cultivation was estimated, and our facilities for market, that such a farm as I described, was as profitable as the lands in his country. I was much struck with the admission. I had seen a paper drawn up by him on the tariff, in which he attempted to reconcile Virginia and Maryland to the measure, by the value of our slaves in the southern market. The sale of our slaves in the south, stands as a reproach both to our morals and agriculture—and if time should arrive when Maryland (one of the good old thirteen) shall settle down as a slave breeder for the new state of Louisania, I shall be prepared for emigration.

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For the Farmers' Register.

GRASS ALONE INADEQUATE FOR IMPROVING LAND. IMPORTANCE OF MANURE.

Charlotte County,
12th March, 1836.

The attention of agriculturists, in this section, has not been sufficiently turned to the subject of raising manure, in order to the improvement of the soil. There has, perhaps, been sufficient attention bestowed, and confidence placed, at least by some planters, in artificial and other grasses—and many of us have lost time and money in searching for substitutes, when none were to be found—and relying on other sources for improvement, than the main dependence, which is the manure of stock and farm yard.

Manuring by stock, and that raised by collecting vegetable matter in our farm yards, are the only real sources of permanent improvement, to any great extent, within the reach of the planters of this district. In vain shall we calculate or hope for improvement, either in soil or purse, unless we turn our attention more particularly to this subject. Unless diligence, perseverance and strict economy are observed in this department, our hopes of improvement will prove vain and fallacious.

Grasses *ungrazed*, will serve to keep the soil together; but alone and unaided, they are extremely limited as a source of improvement, and should not be relied on. They are all-important assistants, but separately considered, they will not perceptibly improve our land. If they improve at all, it is so slow that I have not been able to discover it. I have a field which has been well set with clover for eighteen or twenty years, and there has been no perceptible increase in the production. I consider *grasses alone* insufficient, and not to be relied on as a source of improvement. Plaster in this region, costs too much to use it in large quantities, and we are destitute of marl. What, then, are the principal resources of the planter or farmer for improvement? We answer, unhesitatingly, putrescent manures. Without proper attention to this subject, all hope of improvement will prove visionary—we would, therefore, warn the inexperienced not to rely on grasses *alone*—not by any means to neglect the more important consideration of collecting and increasing the manure heap.

Many sources for raising manure, are entirely neglected by the planters of this vicinage. The considerable amount of manure, which, with a small degree of attention might be raised from hogs, is commonly, wholly lost. The hog-feeder generally selects a clean smooth path to feed his hogs without the inclosure—where the first rain will probably carry the offal, *deposits* and all, into the next stream—and thus the whole is lost.

It is true, that as much manure may be raised from a common stock of hogs, as there commonly is from a like stock of cattle. I have, for several years, fed my hogs on the field intended for corn, in summer—and in winter, confined them every night in well littered pens—feeding principally at night, in order to induce them to come up regularly. The corn is thrown among the litter in the pen, by which the cobs are saved, and as an inducement to keep the hogs as long as possible on the litter. There are many other sources for raising manure, neglected by farmers in this region. This is selected, because it can be seen at a glance. Raising manure is of primary importance, and should be paramount to every other consideration. Collecting litter for the farm yard should not be considered a slight affair, and made a matter of convenience—it should be viewed as a matter of great importance, and all other work should be made to yield and give place, until the pens are well supplied. Unless this *rule* is established and pursued, we must frequently fail in raising a good supply of manure, and fall proportionably short in improvement.

One thing is evident, our richest lands are benefited by the application of manure, and may be improved to almost any extent. There is scarcely a limit to the increase of crop and improvement of soil, not attainable by a proper application of putrescent manures. Here is a wide field, and one in which we shall not be apt to err, by spending too much time or labor. Both lime and gypsum fail on some peculiar soils; but putrescent manure, the plaster of the farm yard, is a never-failing panacea—it always increases the crop and improves the soil, when properly applied. One of your late correspondents speaks of covering the soil to protect it from the cold, &c. &c. I think it a good idea—an excellent one indeed, if he had only added, that the covering must be of good stable manure. This is what the land of your correspondent, and all others in this region, especially needs. Whether they are light or stiff, sandy or loamy—whether the substratum be red, white or any other color, they are all benefited by a good covering of *stable manure*.

Hogs hair is the best manure I ever tried for tobacco plants. I have never seen it applied without considerable effect. It should be beaten with small sticks until the masses are separated, and then sprinkled regularly over the patch after it is sown. I have not used it long enough to decide what quantity is best to be applied. It should be scattered regularly, and so that none of the patch is without. There is no danger of having it too thick, provided it be beaten fine.

I have experienced considerable benefit from the use of the coulter, in preparation for corn, on the bedding plan. The rows are laid off, two furrows to the row, with a coulter as large as a common trowel hoe—and then the bed is raised, the coulter furrow being in the centre. The advantage of the use of the coulter, will be very apparent in the droughts of summer, when the blades of the corn would otherwise be liable to burn.

J. F. E.

IMPROVEMENTS OF MONMOUTH, N. J.

To the Editor of the Farmers' Register.

I take this opportunity of sending you an extract taken from the 1st No. (5th inst.) of the 50th volume of Niles' (Baltimore) Weekly Register.—Should you think it worthy of a place in your Farmers' Register, you are at liberty to insert it. As a work of general reference, Niles' Register is superior to any I have ever read. The editor has ever been the zealous and devoted friend to domestic industry and internal improvements. He has lived to see them both prosper and flourish in his own country.

P. W. HARPER.

Greenfield, Nottoway County.

"For fifty years after the revolution, this county existed in a state of supine torpor. Not five lots were sold, in all this time, in the principal town of Freehold. A few years since, was made the great discovery of marl, which has been a mine of wealth to the farmers, producing the richest pastures and grazing for cattle and sheep, and for making butter and cheese. The consequence has been, that farms which have within 10 years sold at $10 the acre, now bring, readily, from $50 to $100. So much for the virtue of marl. Such is the wealth and enterprise thus brought into the country, that it is now proposed to make a rail road from the principal town, to join the Camden and Amboy rail road at Hightstown, distant 10 or 12 miles, with a spur or branch to the marl pits."

From Niles' Weekly Register.

IMPORTATION OF GRAIN.

It is a singular fact, that two or three cargoes of wheat, rye and oats, have recently been imported from Europe into New York, and have paid a handsome profit to those concerned in the transactions.

From the Washington Mirror.

TRAVELLING STOVES.

Dr. McWilliams of this city (Washington) has taken out a patent for a stove for heating carriages of all kinds, which is one of the most valuable inventions which has ever been made. It is remarkably simple in its structure, and may be sold for six or eight dollars, and it consumes the most inconsiderable quantity of coal. The advantages of such a stove are almost too obvious to be mentioned. Taking up very little room, they may be fitted to the bottom of gigs, chaises, and of every variety of carriage, and are particularly well adapted to rail road cars. The expense of fuel is not above three cents for a hundred miles, travelling at an ordinary rate. It is only necessary to make this invention known to secure its introduction very generally. For a trifling expense, a stage driver may now be as comfortably situated on his box, as by the warm fire; and the pleasure of sleigh-riding may be enhanced a hundred fold. This stove is now used in the cars of Baltimore and Washington rail roads, and gives entire satisfaction. The passengers are kept warm during the whole journey, and are never annoyed by the smoke, the stove being air-tight.

CULTIVATION OF CORN. MANURING, AND WESTERN EMIGRATION.

To the Editor of the Farmers' Register.

Fairfield, S. C.
12*th March*, 1836.

Having seen in your Register a great many communications on the different modes of cultivating Indian corn, I shall endeavor, by showing my method, and the success with which it was attended, together with some experiments I made, to add something to the very great fund of agricultural knowledge, already disseminated through a vast portion of our country, by your valuable paper.

I commenced planting my corn, last year, on the 17th of March. I planted in drills four feet apart, and two feet between each stalk in the drill. I consequently had as many stalks as if I had planted in hills four feet each way, with two stalks to the hill, which is the common method in this neighborhood. My land was well broken up, and in fine order, when the corn was planted. When it was about four inches high, I ran the shovel plough as near it as I could, without doing much injury to the roots. The plough covered up the young grass around and between the stalks, and left the ground, for ten or twelve inches on each side of the corn, in a fine loose state. In about a week afterwards, I had the corn hoed, and some earth put to it—a little more than was taken from it by the hoeing. When the corn was about a foot high, I had it thinned to one stalk. The mould board of the turning plough was then run to the corn, but as shallow as possible, to prevent it from cutting the roots. The middles were broken up with the shovel plough, which left the ground level, except a small ridge made by the turning plough. I ploughed it again the 1st of June, which I could certainly have dispensed with, had not the ground been grassy, and I wished to get rid of the grass—and I believe the ploughing I then gave it, did more injury than good. The hoes followed the ploughs, and chopped down all the grass and weeds that were between the stalks. The field produced an average of thirty-five bushels to the acre, while some fields adjoining mine, and planted in hills, produced only twenty, giving in favor of drilled corn, fifteen bushels per acre, and very little or no difference in the quality of the field. But there is one fact which I do not recollect of having seen in your Register, though I may have overlooked it, namely: that land which will produce one large stalk at two feet distance in the drill, may not be able to support two stalks standing together at four feet distance, which fact I have ascertained by experiment. I planted, last year, one acre of ground in corn, half of it in drills two feet by four, and the other half in hills four feet each way; the stalks in the part that was drilled, were large, and produced, generally, two good ears, while that which was planted in hills, seldom produced more than one; and that one, generally, small. And the reason why checked corn does not produce as much as drilled, (and on my plantation it does not,) is owing both to the greater quantity of nourishment necessary to support two stalks standing together, which nourishment poor land is not able to supply, and likewise to cutting the roots, which, beyond doubt in my mind, is an injury.

Our land is poor; but if a man speaks of manuring his land here, he is immediately pronounced to be "*non compos mentis.*" In fact, the improvement of our land by manuring, is a very serious undertaking, as our only dependence is stable manure and compost; and as cotton is the principal production of this section of country, the time necessarily devoted to raising the crop, and gathering it in, consumes so much of the year, that little time is left for any thing else. But, on the other hand, *one acre of land that is manured will produce nearly, or quite as much, as two that are not.* This is another *fact* I have ascertained by experiment.

"Westward, ho!" is here the rage; and we see daily, lands that, by proper management and manure, might be made to produce one hundred bushels of corn, or one thousand weight of cotton to the acre, worked to death, if I may use the expression, and then deserted, for the swamps of the Mississippi, or the prairies of Texas. The manner in which land is cultivated in this part of the country is a wanton destruction of the means of happiness which Divine Providence has placed at our disposal, and calls loudly for a remedy which can only be obtained from agricultural societies and agricultural papers.

JAMES C. WHYTE.

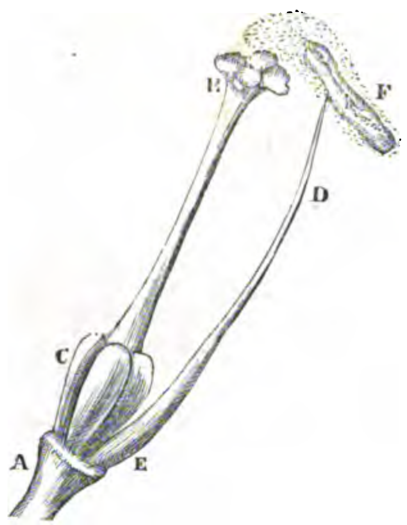
For the Farmers' Register.

VEGETABLE AND ANIMAL ANALOGY.

On the generation of plants.

[Continued from page 229, Vol. III.]

Before I enter upon the subject of the generation of plants, I will observe, that the roots may, with propriety, be called supporters and feeders. They receive from the earth, and convey through the plant, principles which go to their developement and support, creeping in various directions in search of food. The fluid principles are, in all probability, carried forward by capillary attraction, and conveyed by proper vessels into the trunk, branches, leaves, flowers and fruit. Here they undergo a change, a process called secretion; and by a proper union of fluids, are formed, bark, wood, foliage, &c. The germ of plants, is a sexual offspring, and I have reason to believe, is perfect in miniature, requiring nothing but the application of air, heat, light and food, in order to bring about its full developement. Vegetable life, then, is the effect of various *stimuli*, acting upon organs of motion, and is kept up and supported by a due destribution of fluids which circulate in the vessels of plants similar to the blood in the arteries and veins of animals. The roots of plants are of a spongy nature, having tubes running, more or less, parallel with each other, and after reaching the trunk, divide and subdivide into an infinite number of branches, until they pervade every part. These vessels readily admit principles from the earth and atmosphere, which, when combined and properly assimilated, form water, sap, oils, mucilage, &c. Moses tells us in his account of the creation, that plants have their seeds in themselves; that is, every plant contains in itself, male and female powers. The text he has given us, seems to be explained by this discovery, and may lead us to consider that plants wanting local motion, require this union of the sexes in themselves, by which means they may generate without their being in the neighborhood of other plants; they are in this respect, hermaphrodites, having their propagation without the help of one of the same species. The lilly being a flower more generally known than any other, and its generative parts large and exposed, I shall, from thence, endeavor to explain the method which nature makes use of to impregnate the seeds of that and every other plant, and by which means the several species of vegetables have been continued to the world.



The flower of the lilly has six leaves or petals, which are set on upon the summit of the foot stalks marked A in the figure—they serve to guard the parts of generation from the injuries of the weather; and as they are of no other use, it is unnecessary to place them in the figure. B is the mouth of this *pistillum*, or passage, which leads into the uterus C, in which are three ovaries filled with little eggs, or rudiments of seeds, such as we find in the *ovaria* of animals; but these eggs will decay and come to nothing, unless they are impregnated by the *farina fecundans*, or male seed of the same plant. From D to E is a stamen of the lilly through which the male seed of the plant is conveyed to be perfected in the *apex* F, where, by the Sun's heat, it ripens and bursts forth in very minute particles like dust; some particles of this powder falling upon the orifice B, is either conveyed from thence into the uterus C, or by its magnetic virtue, draws the nourishment with great force from the other parts of the plant into the embryos of the fruit, and makes them swell. In this figure, I have only given a design of one stamen with its *apex*, to prevent mistakes in my explanation; but the flower of every lilly has six of the same figure and use, which are placed round about the *pistillum*, or female parts, so that it is almost impossible it should escape from receiving some of the male dust, (or *farina fecundans*,) falling upon it. In this, and other flowers of a like nature, the *pistillum* is always so placed, that the *apices* which surround it are either equal in height with it, or above it, so that their dust falls naturally upon it. And when we observe it to be longer than the *apices*, we may then conjecture that the fruit has begun to form itself, and has no longer occasion for the male dust. And it is likewise observable, that as soon as this work of generation is performed, the male parts, together with the leaves or covering, fall off, and the pipe leading to the *uterus* begins to shrink. We may further remark, that the top of the *pistillum* in every flower is either covered with a sort of velvet *tunic*, or emits a gummy liquor the better to catch the dust of the *apices*.

And now, as we may find in the description of the lilly, that the *uterus* is within the flower, so, on the other hand, the *uterus* of the rose is without the flower at the bottom of the petals or flower leaves. And, likewise, in fruit trees—the cherry, plum, and some others, have their *uterus* or *utricles* within their flowers; and the gooseberry, currant, apples and pears, on the outside or bottom of their flowers. But, further, although nature has designed the dust of the *apices* to fecundate the female parts contained in the flowers or plants; yet, we observe in some plants, the male and female parts are remote from each other; as for example, the gourd, pumpkin, melon, cucumber, and all of that race, have blossoms distinctly male and female, upon the same plant. The male blossoms may be distinguished from the others, as they have not any *pistil* or rudiment of fruit about them, but have only a large *thrum* covered with dust in their middle; the female blossom of these has a *pistillum* within the petals, or flower leaves, and the rudiment of their fruit always apparent at the bottom of the flower before it opens; and so, in like manner, all nut-bearing, and I think, mast-bearing trees, have their *catkins*, or male blossoms, remote from the female parts. The oak, for example, which blossoms in May, has its male parts distinct from the acorns. We find strings of little *farinaceous* flowers in great abundance, remote from the rudiments of the acorns or fruit, and so likewise in the walnut, chesnut, hazel, pine, cypress, and even the mulberry, aspen, and others. I have observed that some sorts of willows change their sex every year, by producing only male blossoms or *catkins* one year, and the other following, strings of female blossoms, which, if they then happen to be near enough some flowering male, will produce seeds not much unlike those of an *apocinum*. When we view with a good microscope the male dust of one single plant, we find every particle of it to be of the same size and figure; but in some cases, it is of two colors, as in the tulip, where it is yellow and blue; but as plants differ from one another in their figures and qualities, so are the figures of their several dusts greatly different from each other; a grain of the dust of the *geranium sanguineum, maximo flore*, is like a bead of necklace with a hole through it, and in like manner does the *farina* of every plant differ in its shape from the rest.

The female parts of generation in plants are best seen in large fruits, without the trouble of the microscope such as the fruit of the pumpkin or melon, where, with the natural eye we may discover the vessels distinctly which make the tunic or covering of each ovary—we may see how the seeds are joined to it, and by what end they receive their nourishment. And again, between the several ovaries enclosed in that fruit, we may very easily perceive the *vagina*, or passage, through which the *farina fecundans* has passed to impregnate the seed.

It may, perhaps, be objected against this hypothesis, that there are many flowers which hang downwards, as the *crown imperial*, the *cyclamen*, &c., and that their *pistils* cannot receive the *farina fecundans* upon them; but if we observe that the *pistils* of these flowers are always more prominent, or somewhat longer than the dusty *apices* which surrounded them, we may easily conceive that the *glutinous* matter and velvet covering on the extremities of the pistils, may be capable enough of receiving and holding some of the powder as it falls: and whether the intromission of the *farina fecundans* be requisite or not, its lodgement on the mouth of the *pistillum* may, by virtue of its attractive quality, perhaps fecundate the seeds contained in the *uterus*.

I am sure, in the production of animals, there are yet greater difficulties to encounter: and it may be, if the analogy between plants and animals was more inquired into by the learned, they might discover many things which would be serviceable to the preservation and benefit of animal bodies, as this knowledge will be to the improvement of the vegetable world. We find, for example, that trees are generally longer lived than animals, some of them living to four or five hundred years; nay, we have some accounts, by tradition, of trees that have lived above two thousand years. The reason, I think, is plain: first, trees have little or no sensation, and it is my opinion, that the senses prey abundantly upon the juices of the body they belong to. Secondly, they always breathe the same air: and thirdly, they feed always upon the same diet. And mankind, who in former times is said to have lived upwards of nine hundred years, subsisted upon simple food, and drank of the clear stream: at least, he had then but little variety of food.

I shall now proceed to what I call the demonstrative part of this system. I made my experiment upon the tulip, which I chose rather than any other plant, because it seldom fails to produce seed. I carefully took out of them all their *apices* before the *farina fecundans* was ripe, or had any way appeared. These tulips being thus castrated, bore no seed, while, on the other hand, those which I had let alone were fruitful. But for a farther demonstration that plants generate, after the manner I have endeavored to describe, I shall recommend to my reader the following experiment: Make choice of such a plant, of the hazel or filbert, as you find to be in a bearing state, and far distant from any other of the same sort; this tree, in January, puts forth what are commonly called *catkins*, which are long *tarums*, composed of very small flowers, that, towards the beginning of March, are covered with a fine dust, or male seed. It is true that the blossoms, or female parts, appear on the buds of the same tree—they are very small, and hardly to be discovered without strict examination, only offering to the view a small cluster of scarlet threads, which are so many tubes leading to the rudiments of the nuts: this happens at the windy season of the year, that the male dust may be more easily conveyed to the *utricles* or female blossoms of the plant. Now, as soon as the catkins appear, they must be carefully taken from the tree, and it will produce no fruit that year, unless you have a mind to single out any particular blossom of it, which may be impregnated with catkins from another tree, gathered fresh every morning for three or four days successively, and dusted lightly over it, without bruising its tender fibres; and in like manner, may the blossoms of any other tree or flower be castrated, and will have the same effect.

By this knowledge, we may change the property and taste of any fruit, by impregnating the one with the *farina* of another of the same class, as, for example, a codling apple with a pearmain, which will occasion the codling, so impregnated, to last a longer time than usual, and be of a sharper taste; or if the winter fruits should be fecundated with the dust of the summer kinds, they will decay before their usual time; and it is from this accidental coupling of the *farina* of one with the other, that in an orchard where there is variety of apples, even the fruits gathered from the same tree, differ in their flavor and times of ripening; and, moreover, the seeds of those apples so generated, being changed by that means from their natural qualities, will produce different kinds of fruits, if they are sown.

It is from this accidental coupling that proceeds the numberless varieties of fruits and flowers which are raised every day from seed. The yellow and black *auriculas*, coupling with one another, produced seed which gave other varieties, which again mixing their qualities in like manner, has offered us, by little and little, the numberless variations which we see at this day in flower gardens. *Auriculas*, whose flowers were of one color, and stood remote from others, have produced no variety.

I need not explain how the male dust of plants may be conveyed by the air from one to another, by which this generation and production of new plants is brought about: but I shall hint, by the by, to such as plant orchards for cider, that they ought to plant only one sort of apple in those orchards, and that such plantations should be likewise remote from other kinds of apples, whose *farina* would else certainly spoil the cider fruit by ripening, some sooner, and others later, which would occasion almost a continued firmentation in the liquor, and never permit it to settle or grow fine.

Moreover, a curious person, may, by this knowledge, produce such rare kinds of plants, as have not yet been heard of, by making choice of two plants for this purpose, as are nearly alike in their parts, but chiefly in their flowers or seed vessels. For example, the Carnation and Sweet William are in some respects alike, the *farina* of the one will impregnate the other, and the seed so enlivened, will produce a plant differing from either. These couplings are not unlike that of the mare with the ass, which produces a mule; and in regard to generation, are also the same with mules, not being able to multiply their species, no more then other monsters generated in the same manner.

We may learn from hence, that the fruit of any tree may be adulterated as well by the *farina* of one of the same sort, which perhaps may be sickly, and of a dwarf kind, as by the dust of some other kind nearly related to it, and worse than itself. Now, as such couplings may be very frequent in the forest, I would recommend the choice of seed, to be made only from such plants or timber-trees as excel in greatness, or other good qualities, and are far distant from others of meaner sorts, which might degenerate their seeds and cross our expectations when they come to grow up, and this is as necessary to be observed among vegetables, to maintain their good qualities in the young plants they are to produce, as it is in the breeding of game cocks, spaniels, or running horses.

There is but one kind of plant that I know of, which seems to be out of this danger of coupling with other sorts, and consequently of either improving or diminishing the qualities of its seeds, and that is the misletoe. The parts of its flowers are indeed as fit for generation as those of other plants; but I have never seen any variety of this plant, nor do I know any other nearly enough related to it to engender with it; for whether we find it growing upon the oak, willow, or any other tree whatever, the leaves, flowers and fruit, with its manner of growth, are all alike. And since I have had occasion to mention it in this place, give me leave to take notice of some particularities belonging to it, as it is neither to be propagated in earth or water, but upon trees and plants only. The ancients made it a superplant, peculiar to the oak, and tell us that although it seemingly produced seed, they did not believe that that seed could possibly be made to vegetate, because I suppose they had tried it in the earth without success. But as it is so frequently found growing on other trees besides the oak, I shall take occasion at once to overturn their opinion in relation to this plant, by showing how it may be propagated from seed upon any tree whatever. About Christmas, when the berries are ripe, they may easily be made to stick upon the smooth bark of any tree you have a mind to propagate them upon, whether it be the oak, ash, elm, apple, pear, plum, rose, gooseberry, or currant, &c. The viscous juice which surrounds each seed, will bind it fast to the part you place it upon; and with this small trouble, you may expect young plants the following year, provided the birds do not devour the seeds you have sown; therefore it would do well to secure them. I have seen twenty plants of misletoe, growing upon as many different sorts of trees and shrubs, in one garden, which were propagated in the same manner I have mentioned. And I believe it would be very useful in correcting the too great vigour of some fruit trees; and to bring them to bear, by taking from them the superabundant juices, which are always destructive to prolificity either in plants or animals.

And now, from the account I have given of the generation of plants, we may learn why double flowers seldom bear seed, because the dust of the apices is too much crowded with the petals or the flower leaves which, for that reason, cannot easily reach the style or pistil of the flower which is always prominent, and above the petals in full flowers. It appears, likewise, that the natural properties of fruits or seeds may be changed by accidentally coupling with other plants, and that the seeds so altered, may rob us of our expectations in planting, by having their principles debauched by the dust of distempered and degenerated plants.

Thus I have endeavored to explain what I proposed, viz: that plants have a mode of generation somewhat analogous to that of animals.

GALEN.

EFFECTS OF THE REMARKABLE PREVALENCE OF COLD, IN SOUTH CAROLINA. REMARKS ON EMIGRATION TO THE WEST.

To the Editor of the Farmers' Register.

Abbeville, S. C. March 11th, 1836.

There appears to be an unaccountable change in the seasons. Gibbon in his history of the decline and fall of the Roman empire, remarks, that while Germany was one almost continuous forest, the Danube was often frozen over, so that armies could pass on the ice in safety; but that in modern times, after the forests had fallen before the labors of civilization, and the marshes have been drained the climate has been so much ameliorated, that such a circumstance in relation to this river has not occurred. But the opening of our country by the removal of the trees, and the exposure of the ground to the fair action of the sun does not seem to have produced this effect here. The early and severe frost of last autumn did material injury to the cotton crops. The preceding spring had been unfavorable to a good stand, which rendered it necessary to replant in many instances. This circumstance made it late before the cotton plant started in its growth. The early frost found it very succulent, and many of the bolls by no means matured. The severe frost which occurred the 5th, 7th, and 8th of October, completely killed the plant, and destroyed the immature bolls. A light frost at that time, that would have merely checked the growth, would not have done much harm. As winter was thus early in assuming its sceptre, it seems unwilling to surrender its dominion to the genial influence of spring. While I now write, the weather is quite cold. There is a good deal of ice, which does not thaw in the shade at 12 o'clock, M. The forest and fruit trees have not yet budded. It has not been unusual in this country for planters to have much of their Indian corn planted by this time. But so wet and cold has been the season, that no one has ventured to commit the seed to the ground. Indeed, they have not altogether finished sowing their oats. Nevertheless, I do not regard the present inauspiciousness of the season as foreboding an unpropitious cropping one; for, when winter is finally broken up, and a vernal sun exerts its fructifying influence upon vegetation, every thing will grow off without a check. It is not safe to plant cotton before the 10th of April, anterior to which time planters generally have their corn in the ground. Our cold weather commenced about the 1st of February, and has continued, with short intervals, until now. We have had no snow this winter in this portion of the state, but we have had two severe sleets, and many cold rains. Last winter was a snowy one with us—the last and deepest fell the 5th of March.

The tide of emigration from this state has been great to the more inviting virgin soil of the southwest. But this flow of population is not confined to South Carolina. Virginia, North Carolina, and Georgia have also beheld, with melancholy emotions, their useful citizens abandoning the country of their birth, and the tombs of their ancestors, to find a home in that enchanting region. This is a deplorable state of things, and ought to invoke the wisdom and concentrate the energies of these states to stop this current which is annually sweeping away so many thousands of their people—and I am glad to see, as an efficient mean to this end, the efforts now making by rail roads, canals, &c. to afford every facility to commercial, social, and political intercourse. Besides these means, however, there must be brought to bear great individual exertion and enterprise. Exhausted lands must be restored—fertile soils maintained in good heart—industry exercised—economy of time and labor consulted and practised. These things would soon put a smiling face upon our country, and take away the inducements to emigrate. I think the prospect already grows brighter, and a reaction is taking place. The fertile cotton regions of the southwest are already nearly filled up. Good land there is high, while land of similar quality here is comparatively low.

The glowing descriptions given of these new countries have acted like a spell—and men have imagined that they have at last discovered the true El Dorado. But the actual view dispels the illusion. Although the soil is more favorable to cotton, and greater crops can be raised than on that from which the emigrant went, yet this circumstance alone will not counterpoise the many disadvantages and deprivations to which he is subject: hence arise discontent and disappointment; and in some instances, men have summoned up sufficient resolution to return to the homes of their fathers, and spend the remainder of their days where they first drew their infant breath. I hope, sir, that your Register will continue to stimulate the people to redoubled efforts in the cause of agriculture, and that our beloved country will again wear the smile of renovated nature, so that there shall no longer be a necessity to leave it, to seek a better. This is a consummation devoutly to be wished.

PATRICK NOBLE.

For the Farmers' Register.

ON HORIZONTAL PLANTATION ROADS.

In bringing to light the causes which have contributed to gulley and waste our lands, there is one in particular, which it appears to me has been entirely overlooked by our modern Jeremiahs, in their bitter lamentations over the desolations of our agricultural Zion, but which ought not to be, by any of her friends who are at this time endeavoring so zealously to build up her waste places, and to establish well her bulwarks: but which it is to be feared will suffer a Babylonish captivity at last, (if our prayers are not heard and answered,) notwithstanding all the lamentations of Jeremiah, or the visions of Ezekiel. This cause, though apparently trivial, is the mischief done by our present plantation roads and paths. The deepest and most appalling cavities, which every where strike the feelings of the farmer with horror, in our wasted and abandoned fields, had their humble origin in small cart ruts! These cart roads, like the ploughing of our ancestors, (which if we do not alter, will be as much censured in after times as we now censure them for perpendicular ploughing) are run right up and down hill: and as soon as one place becomes a little cut up and miry, another is made by the side of it until at least a dozen roads are formed by the side of each other, on the same hillside. It is astonishing how soon a deep gulley is formed by the water, running in these ruts, (so great is the fall,) even during one hasty shower; and unless there be some remedy provided, must continue to waste and mar the faces of our farms—already scratched and gouged in a long contest with Cuffee and his deadly weapons.

To increase and multiply, and replenish and subdue the earth, is a moral injunction; but the latter clause has been practically interpreted in a different signification from what was intended: and the *soil* indeed has been *literally* subdued. A rightful war was waged, since the creation, against the thorns and thistles and other pests—and it was intended that man should "subdue" and suppress the more noxious parts of the vegetable and animal kingdoms, (and some say, uncivilized nations,) and give encouragement, by culture and preservation, to the growth and propagation of those which contributed to the comfort and sustenance of man. The injunction has been misinterpreted, and a long and successful war has been carried on against the soil itself. But while some have been engaged in this ruinous conflict, others, as bad, have laid down the weapons of their rebellion, and have made peace with the earth forever. But to turn away from this scene, which has been the cause of so many feeling digressions in your journal, I have witnessed tremendous gulleys formed also by foot-paths: and how many of these are made in a plantation by people, hogs, sheep, cows, &c., and these in proportion to the poverty of the land and the scantiness of the vegetation. In such fields, (and many there be,) the barren hills serve only as bridges to convey the poor creatures from one distant green spot to another, or to some solitary fruit tree: their velocity and the friction of their feet towards which, are always in proportion to the propelling power, hunger, and their leanness in the same ratio. Indeed, there are so many negroes, cows, sheep, hogs and horses, kept on some plantations, that it appears to me they must tread it entirely over in a few days—so that the whole land becomes one solid beaten track, some idea may be formed of the number of the paths they make, during a snow, though they travel a great deal less at such times. The way these gulleys are made by paths, is, the soil is trodden entirely naked of vegetation, by the shoe and hoof, and nothing to hold the earth together, away it goes the first hard rain. Independent of these gulleys, made by frequented paths, thousands of little gutters are formed all over the fields, by treading off the vegetation, (for which the hoof is admirably constructed,) so that the soil steals almost insensibly away without making any very prominent gulley. This part of the destruction of cattle on land seems never to have been duly considered; but attention turned simply to the depriving the soil of its vegetation and treading the land so hard, as to prevent its reproduction. To prevent the evil of paths, I do not propose to instruct the hogs and cows to walk horizontally around the hills—but these may be kept up on the confinement system, which is infinitely preferable to what I would term the "common" system, which is indeed "having all things in "common." As to the cart roads, let the same direction be given to the wheel, as we have given to the point of the plough, and let the farmer as soon think of ploughing up and down hill, as carting up and down hill. Let the roads be graduated on the side of the hills nearly as the ploughing. Some of the advantages of such roads are briefly these: The object of a plantation road is not so much to lead to one particular point, (like a road to market,) but to have every point of the road as contiguous and convenient to every part of the plantation as possible; for we haul produce from every part of a farm. The land is prevented from *washing* entirely, which is of itself a sufficient consideration. The *draught* in hauling is greatly diminished, and made more uniform—consequently, fewer teams would answer—horses and oxen would be much relieved of their *burthens*, (and of course, would *last* longer—) keep in better *order*—*eat* less, and lose no *time* in balking—*carriage*, which constitutes a large portion of the labor of a farm, would be much *accelerated*, (and of course more of it would be done *per diem*—) *larger loads* might be hauled—*locking* the wheels, *scotching*, and *drag-carts*, would be superseded, and no danger of throwing the weight of the load on the necks of the oxen apprehended, and many other advantages which would be the consequence. The only objection which could be shadowed against such roads, is, increasing the distance in some instances. But this is more apparent, than real; for the distance is not so much increased, by running around a hill instead of over the top of it, as would at first appear. Suppose, for instance, the the road is to reach a point over a range of contiguous conical hills, if a load could be conveyed over the summits of the hills, in a straight line by bridges, the distance would indeed be much less than around the bases; but we have to follow the acclivities and declivities of the hills, which would be double the distance across the summits, and a great deal further than that of a graduated road around the bases of the cones. Again, if we suppose the range of the hills to be hemispherical, the distance over the tops would be precisely the same as a horizontal road around the bases, and the draught infinitely less. In hills of any other construction, where the distance around might be greater, the diminution of the draught would over-balance the distance in favor of horizontal roads, in preference to vertical ones. The more broken the plantation and higher the hills, the more advantageous would be such roads in facilitating carriage. Witness the ease and elegance with which conical mountains are surmounted, by those beautiful spiral, graduated roads. These roads might be made perfectly level transversely, by digging down the hill a little, and nearly level, longitudinally, by the rafter level—and the bank would answer for a conductor. Our horses then might trot (paradoxically) on level ground up hill.

The idea of horizontal roads is not chimerical, they are perfectly practicable; and next in importance, in the preservation of our soil, to horizontal ploughing. I have constructed one over the hilliest part of my plantation—and prefer it, as a rural walk or ride, to any other. The ease and velocity of the laborers getting from one part of a farm to another, is no small consideration. Hence, a farmer can make more, where his crop is in a body. Locomotion is a chief part of farm labor—(in which it differs from other pursuits—) and trudging from place to place, consumes much time. I have been long convinced of the benefit of what are called tram rail roads, between those parts of a farm where a constant communication is kept up. I found one very useful, during the deep snow, from my wood-pile to the house last winter. But lest I should be thought to be becoming too chimerical, by that part of the community who have been so extremely sober, as to do nothing, I stop for the present.

N. E. READ.

From the Genesee Farmer.

THE EXTINCT ANIMALS OF THE ANCIENT WORLD.

It may be well known to most of our readers that the remains of many animals, unlike any that now exist, are found in earth, but more especially in rocks, their bones and shells constituting a part of the stony strata of the globe. A similar remark will apply to a great number of extinct plants. It is not our design to attempt an explanation of the causes which have produced such extraordinary results, though it is due to truth and sound philosophy to say in passing, that the late discoveries in geology amply confirm the Mosaic account of the creation.

We well remember our surprise and pleasure when we first found those "medals of nature" in a rock belonging to one of the ranges of the Alleghany Mountains; but we can offer no observations of our own that would prove as interesting as the following extract from Dr. Hildreth's description of the coal strata of the Kanhawa Salines:

"The whole of this slate and shale is filled with the impression of *extinct* species of plants. Every layer of not more than an eighth or the fourth of an inch in thickness when separated, displays fresh impressions of a variety of species, delineated on the face of the slate with the most exquisite beauty and perfection. The minute markings of the ribs and nervures are faithfully preserved. The vegetable matter is replaced by a thin coating of coal, and when this is removed, the perfect impression is left on the slate. The peeling up or separating of the folia of the shale, seemed to me like opening the leaves of a sealed book, here deposited by the Creator from the earliest ages; containing a faithful and true record of the history of vegetation in its primitive days. Before me was collected a vast library of natural history, containing the stereotype copies of an almost endless variety of trees and plants, whose families and species, as we have every reason to believe, lived and died before the creation of man."

We believe it is no longer doubted that coal is of vegetable origin. In many places among carboniferous strata, are found the remains of large trees,—some standing in their natural position with their roots embedded in what was once soil, though now covered up at great depths in solid rock,—while others lie prostrate, evincing that they were torn up by the roots,and then deposited like drift wood. All these, with hundreds of herbaceous species of the same period, are now extinct. It also appears from the nature of both the plants and animals which inhabited the earth in that "day" that the temperature of the tropics, extended within the polar circles.

Professor Agassiz of Switzerland is engaged in publishing a great work on Fossil Fishes, which is to be embellished with two hundred and fifty plates in folio. He has already examined more than ten thousand specimens; and one year ago, had ascertained eight hundred extinct species. No doubt many others will be found; and our own country may yet furnish its quota. We remember taking the impression of a fish about four inches in length from the slate* rock of this district, a few years ago; but it soon crumbled into pieces. Harder beds of the same rock, however, frequently occur. From the chalk near Lewes in England, some specimens of great beauty have been taken, and one with its "mouth open and entire. The air bladder appears unbroken in many of the specimens, and proves that the bodies were completely incased in the chalk before the putrefactive process had commenced. In some of these fishes, the fins, gills, and teeth, are preserved, as well as the air-bladder and tongue; the scales are also very distinct.

Of those who have been concerned in such researches, no one has been more distinguished for skill and success than Gideon Mantell of Sussex in England. The fossils we have last noticed were collected and preserved in his museum. To him the scientific world is also indebted for the discovery of the *Iguanodon*, a reptile which Cuvier considered more extraordinary than all those previously known. "I measured the circumference of the condyle or joint of a thigh bone in the museum," says Bakewell, "and found it to be thirty-five inches! and the thigh bone of a larger [specimen] at a distance from the condyle measured tweny-five inches in circumference." "Imagine an animal of the lizard tribe," says professor Silliman, three or four times as large as the largest crocodile, having jaws with teeth equal in size to the incisors of the rhinoceros, and *crested* with horns! Such a creature must have been the Iguanodon. "Marvellous as it may appear," says Mantell "we cannot but infer that some individuals attained *a height of nine or ten feet*, and were from *sixty to one hundred feet in length!* A circumstance even more extraordinary than its magnitude, is that of its having performed mastication like [an ox]; its teeth, which are of a very peculiar form, being in general worn down by the operation of grinding its food."

The *"day"* in which this animal lived has been called the Age of Reptiles. "There was a period," says Mantell, "when the earth was peopled by *oviparous quadrupeds of a most appalling magnitude*: and that reptiles were *the lords of creation*, before the existence of the human race." This agrees exactly with the 21st verse of the 1st chapter of Genesis, if we substitute *great reptiles* or "great whales," which the Hebrew text requires.* "It is impossible," says Cuvier, "not to acknowledge as a certain truth, the *number*, the *largeness*, and the *variety of the reptiles* which inhabited the seas or the land, at the epoch in which the strata of Jura were deposited."

We shall briefly mention a few of the most remarkable of these creatures, for which we are indebted, as well as for most of the preceding facts, to Silliman's Journal, appearing there mostly in the form of quotations however, from European works.

"The *Ichthyosaurus*, (fish-like lizard) of which *several species* have been discovered, had a large and long head, with jaws armed with teeth like the crocodile; enormous eyes; a short neck; a large and long body furnished with four broad and flat paddles, composed of numerous bones, and was evidently destined to live in the sea".

This description is from Mantell. One lately discovered in England "must have been at least *thirty-five feet in length*, and of considerable breadth.

The "*Plesiosaurus* (animal resembling a lizard) is yet more remarkable. The *head is very small*, and armed with numerous pointed teeth; the *neck of an enormous length*, and composed of between thirty and forty vertebræ, being *double* the number of that of any other animal, (the swan which has the greatest number of cervical vertibræ having but twenty-three); the body like that of the Ichthyosaurus, has four paddles; the tail is short. This extraordinary creatures appears to have been but little calculated to make rapid progress through the sea," continues Mantell, "and was still less fitted for progressive motion on the land. It is therefore probable that it swam on or near the surface of the water, *carrying his neck like a swan, and darting on its prey.*"

The *Pterodactylus* had the wings of a bat, and the structure of a reptile, with jaws furnished with sharp teeth, and claws with long hooked nails. We have not seen any notice of its size.

"The *Mososaurus*, or fossil animal of Maestricht, attained the size of the crocodile, appears to have been aquatic like the latter, and to have moved its vast tail from side to side as an oar."

"The *Megalosaurus* (great lizard) must have been nearly *forty-five feet in length* and *seven or eight feet in height*. It was probable a terrestial animal."

These notices are principally intended however, to serve as an introduction to other wonders of the primeval ages. In the last number of Silliman's Journal, there is a long article on *the foot marks of birds on rocks* by Professor Hitchcock who is so advantageously known for his Geological Survey of Massachusetts. Eight different kinds of tracks have been examined, and engravings exhibit the shape of the feet. These discoveries were principally made last summer.

These foot-marks have been found in *five* places near the banks of the Connecticut river, along a line of thirty miles in extent. The rock in which they occur, is called by Prof. H. "new red sandstone," and it appears to be equivalent to the Saliferous Rocks which abound in the northern parts of this district. It is worthy of remark that none of these tracks have been found where its surface has been exposed for many years to the weather.

Prof. H. thinks it evident that those foot-marks were "made by an animal with *two* feet, and usually *three* toes. In a few instances a *fourth* or hind toe, has made an impression, not directly in the rear, but inclining somewhat inward; and in one instance, the *four* toes all point forward. Sometimes these ternate depressions run into one another, as the toes approach the point of convergence; but they also sometimes stop short of that point, as if the animal had not sunk deep enough to allow the heel to make an impression. Nay at that point the stone is in some cases irregularly raised, as if the weight of the animal had caused the sand or mud, to crowd upwards in the rear of the step. In a few instances also, behind this slight elevation, there is a depression as if a knobbed heel had sunk slightly into the yielding mass."

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* Pyritiferous slate of Eaton.

*Silliman's Journal, vol. xxv. p. 35—6.

"The successive layers of the rock *are bent downwards*, under these impressions, often two, three, and even four inches in thickness. These tracks have been traced, and no less than ten have succeeded each other in such a direction, and with intervals so nearly equal, that it is impossible to doubt that they originated from the continuous steps of an animal. The alternate tracks deviate a little to the right, and the others to the left, the toes being ordinarily turned outwards. It is easy to determine whether they were made by the right or left foot of the animal."

Prof. H. is satisfied that these tracks were made on soft mud, (now rock,) at that time under water; and that the birds were of the tribe of waders, like the crane. He also concludes from decisive evidence, that the mud then lay horizontally, though in one place it now has a dip of 30°. The rock has consequently been sunk or elevated since that period.

Some idea may be formed of the size of these primeval birds by comparing their foot-marks with those made by birds of the present day, and this Prof. H. has carefully done. The foot of the pea-hen is three inches and a half long, and its step is nine inches; the foot of a large cock turkey is four inches long, and its step twelve inches; but the *Ornithichnites giganteus* had a foot sixteen or seventeen inches long, and its step was from four to six feet! while *O. ingens*, which is remarkably distinct from the former, left a track not less than two feet long with a step of six feet! The step of the African Ostrich was not known, but the length of its foot is only ten inches. Prof. H. therefore conjectures that the heads of these birds must have been elevated from twelve to fifteen feet above the ground!

In conclusion, we would add that these discoveries are entirely new, no impressions of the kind, in any other part of the globe, having been known to geologists. It has been remarked that there are fewer traces in the rocks of the existence of birds, than of any other class of animals; and this circumstance has been accounted for on the ground that they are less liable to be submerged, and of course less likely to be preserved in aqueous deposites. The rocks on which these birds left their tracks, are *older* than those in which reptiles occur in the greatest numbers.

Fairfax County,
March 1, 1836.

To the Editor of the Farmers' Register.

THE WINTER. OYSTER SHELL LIMING.

Winter, after five weeks of desperate and unflinching severity, was relaxed but for a few days, when, from the north and east, the rear guard was brought up in overwhelming array—and our cows and sheep, like the rats in some of your correspondents fields, are running about with tears in their eyes. If cattle keep a record, this will be marked as the expunging winter.

* * * *

I pray your pardon for having travelled my hobby so far from my original purpose, which was to say, that I have purchased oyster shells and hauled them 7½ miles, and burnt and spread them over 60 acres of land, and this since I lofted my corn. If I can obtain shells by public advertisement, I will use from 10 to 20 thousand bushels during the year. I am too old to go to the land of milk and honey; and must, therefore, give my premises a new constitution, and stick to her until "death doth us part." I confess, sir, that I am not exactly pleased with my employment, but I see not how I am to do better.

Had your Agricultural Convention taken place in good weather, I should have attended; but I could only have recommended to the meeting one thing—to do their duty, and then communicate their doings through the Register to the public. In this way we may do much. Prosperity, I trust, awaits your laudable purposes.

X. Y. Z.

From the British Farmers' Magazine.

ON THE DESTRUCTION OF SEED CORN.

There is a probable destruction of every kind of corn, after it is sown, for which it is difficult to account. The quantity usually sown broadcast on the imperial acre in this country, is 3 bushels of wheat, 5 of barley, 6 of oats. It has been ascertained that 3 bushels of wheat, weighing 61½ lbs. per bushel, containing 2,685,912 grains; five bushels of barley, weighing 53¼ lbs. per bushel, 3,135,360 grains; six bushels of potato oats, weighing 43½ lbs. per bushel, 4,434,912 grains; and the same quantity of common oats, weighing 42 lbs. per bushel, 4,241,664 grains. The highest rate of produce in this country of these three kinds of corn is, in the Carse of Gowrie, which contains the finest quality of wheat land, about 52 bushels per imperial acre; in Forfarshire, which is, perhaps, the best county in Scotland for barley of uniformly fine quality, 60 bushels of barley per acre have been reaped; and in Strathmore, a fine district for oats, 72 bushels per acre of potato oats have been reaped.

Now, if every grain of seed sown germinated and produced a stem bearing the average number of grains in each ear, the produce would be as many times the seed sown as there was number of grains in the ear. On examining a prolific crop of corn, we shall find ears of wheat containing from 61 to 24 grains each, the average may be stated at 44 grains; the grains in an ear of barley range from 21 to 32, the average may be 28; and of potato oats the diversity is as great as from 182 to 20 grains in each head, the average being about 64. Computing what ought to be the produce by this supposition, in conjunction with the facts above stated, it should be, of wheat, 44 times the seed sown, or 132 bushels per acre; of barley, 28 times, or 140 bushels; and of potato oats, 64 times, or 384 bushels. But we have seen that the greatest actual produce in the richest districts of the country is, of wheat, 17 times, and of barley and oats, only 12 times, the seed sown, which fall very far short of what the produce should be, as indicated by the number of grains in the ear.

There is moreover, a property connected with the growth of corn which affects the question of produce very materially. All corns produce more straws than one from one root. They do not so invariably; but the instances of a single straw from one root are rare in comparison with a number. Single straws are more rare in wheat and in barley than in oats. As many as five stems of wheat and barley may be seen from one root; two, three, and four, more frequently, and three most frequently. Many favorable circumstances must co-exist to determine the number of straws which will be developed from one root. Rich soil, either naturally so, or made so by manure and judicious culture, will produce more straws from the same number of roots than poor. A fine season has a similar effect, in this respect, to a rich soil. Early sowing will, in general, also produce a similar effect. For example, in regard to wheat, a rich and suitable soil will cause it to "tiller or stool,"—the technical terms in use to express a multiplication of straws from the same root; while a poor loose soil will scarcely be able to produce one straw from every seed that geminates. A fine season. particularly a fine spring, always causes wheat to tiller boldly; and early-sown wheat in autumn will tiller and cover the ground before the approach of winter. There is a variety of wheat cultivated in the borders of Scotland, which possesses the property of tillering in the autumn in a remarkable degree. It originally came from Danzig, and is called Danzig creeping-wheat.

Taking, therefore, in the case of a prolific crop, three straws of wheat and barley, and two of oats, as an average number from one root, and supposing, as we formerly did, that every seed sown produces a root, the produce of wheat ought to be 132, instead of 17 times; of barley 84, instead of 12 times; and of oats 128, instead of 12 times the seed sown. Or, to place the same result in another point of view: According to the number of grains contained in the quantity of corn sown on an acre, it appears that a square foot of land receives, of wheat 61, barley 72, potato-oats 97, and common oats 101 grains. By tillering, the 61 grains of wheat should produce 183 straws; the 72 of barley, 216 straws; and the 101 of oats, 202 straws, on a square foot of land; whereas the number of straws, with the tillering of the roots, does not really exceed one-third of those numbers on that space of ground. The inevitable conclusion is that only one-third of the seed-corn sown on the best land grows, the other two thirds are somehow destroyed. This conclusion is startling, and may appear incredible to those who pay little attention to these matters: the facts which prove it are accessible to all. But if this proportion of the seed-corn is destroyed in the best soils, a still greater destruction probably happens in the average quality of soil in the country.

The average produce of the average quality of soil is only seven times the quantity of the seed sown. The quantity of seed sown per acre has hitherto evidently been ascertained by practice alone. The seed has been sown up to the quantity which produced a full crop, and then that quantity had been fixed upon as requisite for the crop; but now we see that one-third of that quantity is sufficient for the crop. Ought we then to sow only the third? Prudence would decide in the negative, till it is ascertained how the loss of the two-thirds arises. That loss in the mean time is of great magnitude. The number of cultivated acres in Great Britain and Ireland amounts to 47,000,000; 30,000,000 of which are under the plough. Two-fifths of the latter, 12,000,000 acres are annually under the cereal crops. The average allowance of seed for the three kinds of corn may be stated at 4 two-thirds bushels per acre. The quantity of seed annually sown thus amounts to 7,000,000 quarters. If two thirds of this quantity are rendered unproductive by some agency which has hitherto been uncontrolled, then 4,666,666 quarters of corn are annually wasted! The quantity thus lamentably wasted would support more than 1,000,000 of human beings.

From the Edinburgh Weekly Chronicle.

FLOURISHING STATE OF AGRICULTURE.

Some writers have puzzled themselves in the endeavor to account for the cheapness of corn, but it is simply owing to abundance, and the abundance to the recent improvements in agriculture here and in Ireland. No species of production can be the object of long continued attention, without ways and means being discovered of increasing the supply, and diminishing the cost of production, and consequently the exchangeable value. And it would have been strange, if, while improvements were daily taken place in every department of arts and manufactures, agriculture alone had remained stationary, the amount of its produce as low, and its price as high.

The truth is, great and gratifying as have been the improvements in manufactures, they do not, perhaps, grratly exceed those which have, during the last ten or fifteen years, been introduced into agricultural operations. It is only about twenty years since the first steam-engine was erected in East Lothian for thrashing grain, an example which for some years was followed by few, but during the last eight or ten years they have rapidly increased, and we know for certain, that there are now upwards of sixty in the country. Judging from present appearances, there will not in five years hence be a farm in the county of the extent of 150 acres and upwards, and destitute of water-power, without its steam-engine.

In East Lothian—we speak chiefly of East Lothian, because better acquainted with its concerns than those of other counties, but agriculture is every where rapidly progressing—tile or furrow draining is but an introduction of yesterday, and already thousands of acres have undergone this admirable improvement. So lately as the summer of 1832, furrow draining was, we believe for the first time, practised in East Lothian, and in one field only. The field in questions had been previously thoroughly cross-drained, lime and manure had been poured into it with a liberal hand, but all without avail. At length drains were put into every other furrow, and immediately two pickles grew where but one would grow before; the first crop repaid the whole expenses incurred. On the same farm 100 acres, or all that requires it, have since been furrow drained, partly with stones and partly with tiles. On another farm, with which we happen to be acquainted 200 acres have been tile drained, partly in every alternate furrow, the two intervening ridges being thrown into one, and partly in every furrow, during the summers 1833, 34, and 35; and on a third, 100 acres have been similarly dealt, with during the two last summers. We have ascertained that there are upwards of three millions of drain tiles at present annually manufactured in the country; and yet the tile-works in existence occasionally find it impossible to supply the demand, and others are about to be erected. Three millions of tiles are sufficient to drain 2,000 acres, putting a drain in every alternate furrow.

It is now about ten years since rape cake was brought under the notice of agriculturists in this part of the country, and it has been for some years in extensive use. One agriculturist, we know, of who manures the whole of his fallows with it, at annual expense of £600. Some hold that it is useful for one crop only, and affirm that it bears the same relation to common stable dung as a manure, that a dram does to a beefstake as articles of human subsistence. The agriculturist in question, however, who speaks from experience, thinks differently, and is of opinion that rape-cake has added three or four shillings to the [rent] value of land situated at a distance from towns where it is difficult to obtain a sufficient supply of manure. As another proof of the intelligent readiness with which everything likely to prove an improvement is adopted, we may instance chevalier barley, which, though only introduced three or four years ago, was last year almost the only variety cultivated in East Lothian.

These facts are sufficient to show that, amidst other improvements, agriculture has not been standing still. And as improvements in manufacturing machinery have led to a fall in the prices of manufactures, so to improved modes of agriculture are we indebted for the blessing of plenty at present enjoyed by the country. And we conceive they may also be received as proofs that agriculture, in the extensive meaning of the term, so far from being in a backward and depressed condition, is really thriving beyond all former precedent. Individual landlords and tenants are no doubt suffering, but not because agriculture is not in a promising state: but because of arrangements entered into years ago, in the expectation that the high prices caused by temporary circumstances would be permanent. It would be no more reasonable to say that the cotton manufactures are in a drooping state, because the price of cotton goods has fallen, than that agriculture is in distress, because agricultural produce fetches less in the market than it did some years ago. When cotton fell in price, those who happened to have large stocks on hand, or to have contracted for supplies before the fall, no doubt suffered loss—many were perhaps brought to ruin; but it did not follow, that the cotton manufacturers were, as a body, engulfed in destruction. Nor, because individual farmers, with old leases on their hands, cannot fulfil their contracts with the present prices, can it fairly be agreed that agriculture is in distress. The capital which is so ungrudgingly expended in agricultural improvements, and the energy and ability displayed by agriculturists, is a symptom the reverse of discouraging, with respect to the condition and prospects of agriculture. When the price of every commodity has fallen so greatly, landlords cannot expect to receive the same nominal rents, as when the prices of every article of consumption were from one-third to one-half higher.

Those who are most diligent in the improvement of their estates will, as formerly, receive the highest rents. It will not do for them to imitate the lazy Lawrences of the south, who walk about with their hands in their pockets, and then complain of want. But it is from the south that the cry of agricultural distress has chiefly proceded; that is, from those who resolutely adhere to the imperfect and expensive custom of their forefathers, and refuse to adopt the most self-evident improvements—who still continue to employ from three to five horses at one plough, and thrash their grain with a couple of sticks cut from the nearest plantation. It is ridiculous to hear such men complaining of distress. A spendthrift may as reasonably complain of empty pockets, or a drunkard of the effects of his dram-drinking.

From *British Husbandry.*

ON PUTRESCENT MANURES.

[Continued from p. 734 Vol. III.]

Night soil is distinguished from the ordure of all animals by the extreme fetidness of its smell, and is also known to be of a stronger or hotter kind, and probably differs in its own qualities in proportion to the sort of provision from which it is obtained, as there is every reason to suppose that the excrement arising out of animal food is of a more active nature than that which is the produce of a vegetable diet.* In all those places where the

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* 'Human ordure is full of oil and volatile alkaline salts.'—'The dung of carnivorous animals is also plentifully stored with oil.'—Hunter's Outlines of Agriculture, p. 13.

Arthur Young gives the result of two experiments on manures of different kinds and qualities, applied to potatoes on poor gravelly loam, in the following proportions per acre, as follows:—

			First crop.	Second crop.
No. 1	No manure	- - -	120 bushels	140 bushels
2	Night-soil	10 wagon-loads, each 96 bushels	600 „	640 „
3	Do.	6 „	650 „	500 „
4	Do.	2 „	500 „	300 „
5	Bones	10 „	650 „	640 „
6	Do.	6 „	640 „	560 „
7	Do.	2 „	560 „	240 „
8	Hog-dung	60 one-horse cart-loads „	480 „	300 „
9	Do.	30 „	480 „	160 „
10	Yard-compost	60 „	300 „	240 „
11	Do.	120 „	480 „	300 „
12	Do.	30 „	140 „	140 „

Survey of Hertfordshire, p. 177.

real value of this feculent matter is duly appreciated, and its preparation well understood, the aversion which its use excites is surmounted, and it is there preferred to all other manure. It has indeed been assumed that the excrements of a man, when used for this purpose, can be made to produce a sufficiency of corn and roots for his support; but, although that assertion has been exaggerated, yet were all the nourishment which could be extracted from this species of ordure made available, there can be but little reason to doubt that it would add largely to the production of the land; for it has been proved by numerous experiments, to rank far before the dung of any animal. In this country, however, it is very commonly allowed to become decomposed through want of care, and vast quantities are carried off by rivers from the large towns, and lost in the bosom of the ocean—an inattention which has partly arisen from the disgust occasioned by its odor, and partly through a prejudice to which that disgust has given rise.

This repugnance proceeds from an idea that this manure communicates an unpleasant flavor to plants grown in the land upon which it has been used; and it has been also thought to have a bad effect upon the soil. Both of these objections are however groundless when due care is applied to its management. Instances are indeed said to have occurred, in which horses have refused the hay made from grass which had been manured with night-soil; but, if credit is to be attached to the assertion, it must have been produced by its having been spread in a fresh state, and upon grass of very forward growth. In proof of this, is an instance, mentioned in the Norfolk Report, of a field newly laid down to grass, every part of which proved very poor, except two acres on which four wagon loads of night-soil were spread directly, without being mixed with any other manure. The field was fed off, and the effect of the night-soil is said to have been so great, that, 'while the rest of the field never seemed more than half filled with useful plants, this part thickened surprisingly, and grew most luxuriantly; so much so, that the cattle, neglecting the rest of the field, were perpetually feeding there, until by autumn it was pared down, like a fine green lawn by the side of a dusky, rough, ragged pasture.* In other accounts it is indeed reported as 'the most capital manure, of all other sorts, for pasture, two wagon-loads securing a carpet of herbage;'* and no bad effect is perceptible on vegetables, though kitchen-gardeners use it with profusion. It has been also asserted that nice judges of vegetables can distinguish a very unfavorable difference between the flavor of those grown in the vicinity of large towns or in the open country, and this they attribute partly to the use of night-soil; but it certainly communicates no unpleasant smell to the plants, nor even, after a very few days, to the ground on which it has been laid, for it is soon decomposed, and the effect complained of is doubtless more owing to the rapidity of the growth when forced by an excess of any stimulating manure, which renders them insipid; and were market-gardeners more sparing of the use of all dung, or were they to correct it into a compost by a judicious mixture of lime and earth, or a small portion of slaked lime, the evil complained of would, no doubt, be removed†.

All unpleasantness of odor may indeed be prevented by the mere use of ashes; and were those thrown upon the night-soil, or into privies which have no communication with sewers, the ashes made in every dwellinghouse would so completely absorb the fluid, that a solid heap of manure would be produced, that might be afterwards removed without difficulty or offensiveness. This, besides being common in many parts of the continent, is the regular practice throughout Hull;‡ and were it more generally followed in other towns, there can be no doubt that it would be attended with very beneficial effects to the agriculture of their neighborhood. It is also collected in considerable quantities in London; and there was, a few years ago, a large manufactory for its preparation, in which it was dried and exposed to the

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Two nearly similar experiments have been also recorded by the Rev. James Willis, President of the Christ Church Agricultural Society, in which the superiority of produce arising from the different sorts of dung was in the following order:—1st. That from pigs: 2nd. sheep; 3rd. horses; 4th. cows. In another, however, that from sheep was first, and pigs second; and Sir Humphrey Davy gives the preference to that of hard-fed horses, then of sheep and deer, and lastly oxen. Treaty on soils and Man.: Anon. p. 128—131.

* P. 172. The same Survey also mentions the great improvement of a piece of steril pasture by the application of night-soil mixed up with pond-mud, in the proportion of 7 wagon-loads of the former to 143 one-horse cart-loads of the latter. The soil was first laid upon the mud, the men then cut a trench through the heap, and throwing a small parcel into it, they worked it all to pieces. The compost was afterwards spread over the field at the total expense of £12; but at the present price of labor it would probably amount to half as much more.

* Survey of Essex, vol. ii. p. 241. One wagon-load, containing 90 bushels of night-soil, cost in London 15s., to which is to be added the charge of carriage to the farms, to which it is mostly conveyed by the Thames, or by canals. Much of it is used in Essex, mixed with five times the quantity of fresh earth and sometimes together with an equal quantity of the muck and chalk, in which proportions it is commonly used, at the rate of one wagon-load of night-soil; and the whole charge, including that of spreading, is calculated to be from £2 13s. to £3 3s. per acre. The common price of stable-dung in London is 2s to 2s. 6d. per hay-cart load, containing between 70 and 80 cubical feet: that of street-slop, called cold manure, is delivered by barges to the distance of about fifteen miles, by the canals, or within reach of one tide by the river, at about 3s. per ton. Middlesex Report, 2d. edit. p. 375.

† Russell's Treatise on Practical and Chemical Agriculture, p. 205. Derbysh Rep. vol. ii. p. 454. It is also contradicted by Count Gyllenborg, in his very erudite treatise on Chemical Agriculture, in which he mentions an instance of his having regularly watered a vine with putrid urine, but neither the grapes nor the wine contracted any bad taste. Pilkington's Translation, p. 79. *Slaked-lime* is, for this purpose, preferable to that which is *hot;* for the latter, when combined with animal matter, forms a manure which is not soluble in water.

‡ See a letter on the subject, detailing the practice, together with remarks on its extension, in the Farmer's Magazine, vol. x, p 497. Also the General Report of Scotland, vol. ii. p. 525; and Communications to the Board of Agriculture, vol. i. p. 317.

sun by spreading it upon flag-stones gently inclined, to allow it to drain, after which it was broken into pieces, and removed under cover, where it was partially mixed with lime and completely reduced to powder. In this state it was packed into barrels, and exported even to our colonies, where it was used as a top-dressing, but was chiefly employed by market-gardeners, who used to sow it in drills along with their seeds, and, judging by the price at which they bought it, there can be no doubt that they found its use to be singularly advantageous; but the process has been abandoned, for, having been carried on in the heart of the town, it occasioned complaints of its offensiveness. This, from the inconvenience attending its conveyance, unless by canals, has greatly prevented its use: considerable difficulty has also been found in reconciling farm-servants to working at the preparation of this manure; but that objection can be easily overcome by a slight gratuity, and, considing its great value as a dressing, it ought not to be neglected. It is said that one load, in its dry state, will be, in all cases, quite sufficient for three acres of drilled wheat.*

Its operation has been found quicker and more powerful than farm-yard dung; but not so lasting. Farmers who have used both on adjoining land have observed that the crops are always more exuberant in the first year where the night-soil has been laid, but that little or no difference has been afterwards perceptible.† Its effects, when spread alone upon field-crops, and directly ploughed in with a shallow furrow, are indeed so violent, that grain manured with it has been known to run entirely to straw; yet it has been used in that state as a dressing for turnips, and also for spring wheat, upon the fallow, upon thin and chalky soils, upon which the largest crop and the finest grain was grown upon a very extensive farm, upon which it was laid to the extent of three wagon loads per acres, though it probably was partly mixed up with the sweepings of streets.‡ It should however be incorporated with other substances; and as it is very difficult to procure it in any other than a nearly liquid state, it is proper that every means should be taken to secure it. A mixen should therefore be made consisting of fresh loam, decayed tanners' bark, peat or any other like substance, to the depth of about two feet, to which the night-soil must be drawn, and then carefully thrown over it with scoops to a moderate thickness; after which another layer should be added of loam, or a compost of the same substances, and in the same manner, though not quite so deep as before; then another of night-soil, until the whole has attained the proper height, when it is to be covered with the same materials, to which if a small quantity of quicklime be joined, or mixed with the layers, it will assist the decomposition of the heap, and its nauseous effluvia will be destroyed. To every load of night soil, about four or five times the same quantity of earth should be added, according to the nature of the soil, and to the degree of excitement intended to be applied to the land. It should then be regularly turned and throughly mixed, and may be used either for wheat or barley in the proportion of one wagon-load of night-soil, containing as much as four horses can fairly draw, to the acre; but it should be used more in the manner of a top-dressing than buried in the soil. It has been laid on in the large proportion of 40 double cart-loads, and it has afterwards been known to produce 5½ quarters per acre of spring-wheat; besides an uncommonly luxuriant crop of rye-grass and cover in the ensuing summer.† It is sometimes, also, mixed with the yard-dung for the purpose of exciting fermentation: this, however, is not advisable, for it produces its great effect in an unfermented state, and when thus mixed, its power is greatly lessened.

It is likewise converted into powder for the purpose of manure in Paris, and is also used throughout many parts of the Continent, but chiefly in the Netherlands, where, however, it is more commonly employed exclusively in a liquid state; of the preparation of which we extract the following account from the intelligent Report by Mr. Radcliff of the Agriculture of Eastern and Western Flanders.‡

Liquid manure.

'This consists of the urine of cattle, in which rape-cake has been dissolved, and in which the night-soil from the privies of the adjoining towns and villages has also been blended. This is gradually collected in subterraneous vaults of brick-work, at the verge of the farm next to the main road. Those receptacles are generally 40 feet long by 14 wide, and 7 or 8 feet deep, and in some cases are contrived with the crown of the arch so much below the surface of the ground, as to admit the plough to work over it. An aperture is left in the side, through which the manure is received from the cart by means of a shoot or trough; and at one end an opening is left to bring it up again by means of a temporary pump, which delivers it into carts or barrels. Another cistern, of double that size, is however for the most part formed under the range of stables, from each stall of which the urine is conducted to a common grating, through which it descends into the vault, from whence it is taken up by the pump; but in the best regulated, there is a partition in the cistern, with a valve to admit the contents of the first space into the second, to be preserved there free from the later acquisition, age adding considerably to its efficacy. The smallest of them will hold 1000 barrels of 38 gallons each, and in that quantity from two to four thousand rape-cakes, of 2lbs. each, will have been dissolved.

'This species of manure is indeed relied on beyond any other upon all the light soils throughout Flanders; and even upon strong lands, originally so rich as to preclude the necessity of manure, it is now coming into great esteem, being considered applicable to most crops, and to all the varieties of soil.'

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* The following has been recommended as the best mode of pulverizing night-soil:—'Spread it on a piece of grass; let it be well harrowed on a bright day; then put it under cover, and add a chaldron of lime to 4 loads of muck in that state, and it will become dry.' Rigby's Framingham, p. 102.

†Appendix to the General Report of Scotland, vol. ii. p. 82.

‡ Malcolm's Survey of Surrey and the Neighboring Counties, vol. ii. p. 28.

† Farmers's Magazine, vol. xiv. 161. It will not escape observation that the amount of this manure would have been better stated if the quantity had been accurately, ascertained in bushels; but that is a trouble which few farmers take, and information can only be given in the same manner in which it is obtained.

‡ Chap. iv. sect. ii. and chap. v. sect. iii.

The crop upon which it is, however, chiefly bestowed, is *flax*, in the following manner and proportion. 'The field, after two or three ploughings and harrowings, is backed up in the centre, and ploughed round in but one set, so as to leave it without any furrow. A heavy roller is then drawn across the ploughing by three horses, the manure is spread equally over the entire surface, and, when well harrowed in by eight or nine strokes of the harrow, the seed is sown, which is also harrowed in by a light harrow, with wooden pins of less than 3 inches, and the surface, to conclude the operation, is again carefully rolled, so that nothing can exceed the smoothness and cultivated appearance of fields thus accurately prepared.'

The manner in which the manure is applied is in one or the other of the following modes, according to the distance. 'Where the cart plies, the manure is carried in a great sheet, closed at the corners by running strings, and secured to the four uprights of the cart: two men, stand one on each side, scatter it with hollow shovels upon the ground. Or, where barrels are made use of, each is carried by two men with poles, and set down at equal distances across the field, in the line of the rolling. There are two sets of vessels, which enable the men who deposite the loaded ones to bring back others empty. One man to each vessel, with a scoop, or rather a kind of bowl, with a long handle, spreads the manure so as to cover a certain space; and thus, by preserving the intervals correctly, they can precisely gauge the quantity for giving effect to any extent of surface.' It must, however, be admitted that this mode of application is somewhat clumsy, and that it might be improved. For the flax crop they are profuse, for they usually allow at the rate of 2480 gallons, beer measure, to the English acre.*

It thus appears that the dissolution of the oil-cake and sufficient time for the thorough putrefaction of the contents of the cistern is the only preparation of this manure; and it is stated that 21 acres, upon a farm of 200, are most luxuriantly manured for crops of flax and rape with the urine —exclusive of the dung—of forty-four head of cattle.† It must, however, be borne in mind that, although the Flemings have too just a sense of the value of money to lay it out with the prospect of a profitable return, yet the construction of such a building as that described is calculated at about £120: in this country it would probably cost considerably more; and, as it cannot be removed, it will not suit the means of every farmer to be at the expense, unless he can obtain the assistance of his landlord.

In another account, drawn up in consequence of an investigation upon a very extensive Flemish farm, by persons appointed to examine the plan, (which had been objected to by several intelligent practical men,) it was declared, 'that, owing to to the judicious concavity of the farm yard, there was as much moisture as was necessary to ferment the straw; and it is now ascertained that liquid manure is the most efficacious of any, and produces a third more effect than what is spread upon the surface. Hence, after the dung is fermented, they dilute it in water, and the liquid alone is carried to the field, and scattered over it, The earth immediately imbibes the liquid, which soon reaches the roots of the plants, and causes a rapid vegetation; whereas it is a long time before dung, in a solid state, fertilizes the soil. The straw that remains, after the dung is thus washed, is applied as manure for potatoes.‡ This mode has been, indeed, extensively carried on in other parts of the Continent, and its effects are considered as equally beneficial. There, by some farmers, water is regularly thrown over the dunghills, the oozings from which are allowed to drain into pits constructed for the purpose, and permitted to ferment before they are laid upon the land; or, by others, the whole of the dung and stall-litter is immersed in water, which, after a certain time, is pumped up from the pits, and applied in a liquid form; in which manner it is contended that this manure is not only more powerful in itself, but the quantity is thus doubled, for the solid contents of the dunghill remain the same. Experiments on an extensive scale have incontestably proved the efficacy of liquid manures upon sandy or other light soils, to which they impart consistency, and dispose them to retain moisture; nor can there be much doubt that in many cases the product of a single crop may be thus more than doubled, by its immediate contact with the plants.

On heavy land, we however coincide with the opinion of that eminent agriculturist the Baron de Thaër, from whom this account is taken, that it can never replace the solid contents of the dunghill; and, although not contesting the advantages of which it may be susceptible when applied to those soils and crops to which it is peculiarly applicable, we yet doubt the extraordiary degree of power ascribed to it. Before this mode of preparing manure be generally adopted, it should also be well ascertained whether the pains and expense attendant upon it do not overbalance those of our own common management; for although it

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* The average produce of crops upon a sandy loam, and the quantity of manure for each per English acre, when applied to the land, is thus stated:—

Wheat, 22¾ bushels - - - - - -	Either dung or compost, 10½ tons.
Rye, 28½ do. - - - - - -	Farm-yard manure, do.
Oats, 51 5-6 do. - - - - - -	Do. do.
Flax, 6½ do. of seed and stem, worth £17 16s. 9d. -	866 cakes of rape, dissolved in 2480 gallons of urine.
Rape-seed, 32 2-5 do. - - - - - -	580 do. dissolved in 3200 gallons of do.
Beans, 28⅓ do. - - - - - - -	14 cart-loads of liquid manure and the same quantity of stable-dung, equal together to 21 tons.
Potatoes, 8 5-6 tons - - - - -	Do do. do.

—Radcliff's Report of the Agriculture of Eastern and Western Flanders, pp. 90, 91.

† Sir John Sinclair, however, says, in his 'Hints on the Agricultural State of the Netherlands,' that in another farm it required the urine of 68 cattle, of various ages and 32 horses, to manure 40 acres.

‡ Ibid. p. 67.

is possible that, in the former way, a more complete decomposition of the materials may be secured, and that thus new combinations of nutritive matter may be formed, of the precise effects of which we are ignorant, yet, in our usual method of preparation, when properly conducted, nothing should be lost: the liquid drained from the dung should be collected for further use; and it is only upon such a calculation of the charges, as well as experience of the effects of the manure, that a fair conclusion can be drawn regarding its real value.*

There is, perhaps, no part of the world in which the preparation and the practical application of vegetable and animal manure is so well understood as in China; but, owing to its overflowing population, almost the whole of the labor is performed by man, by which the number of working animals is so much reduced, that night-soil forms the principal dependence of the farmer. It is extensively employed in a dried state, and is sold, as an article of commerce, throughout the empire, in the form of cakes, mixed up with one-third of their weight of marl. It is, however, in its liquid state, as urine, that it is chiefly used, in combination with other substances, the account of which, as furnished by a gentleman who was long resident in the country, is too curious to be omitted.

Into a cask or jar is put a collection of putrid animal substances, consisting of flesh, fish, blood, &c., to which is added a certain quantity of urine, but the vessel is not completely filled. A mandarin, or officer of government, then attends, who, upon the vessel being closed, affixes his seal, and in which state it must remain for six months at least. When this, or a longer period, has elapsed, the mandarin removes his seal, and grants a certificate as to the quality of the preparation, which is shown by the proprietor, who cries it through the streets as a manure for gardens, and it is sold in quantities as small as an English pint. Before using, it is always diluted with four or five times its bulk of water, and it is extensively used for garden-crops, but universally in drills. The writer adds that he was informed by several intelligent Chinese, that human urine, thus prepared, forms a fourth part of all the manure employed in China, and which is never used until it has reached a high state of putridity.

That an article considered of so much importance in that country should in this, where agriculture has arrived at such great perfection, be so much neglected, is not easy to be accounted for. The quantity of urine voided daily by an individual of moderate size has been shown, by a series of experiments, to amount to about half a gallon, which, if due attention was paid to the collection of it, would according to the Flemish mode of its application, be a sufficient manure for half a rood of ground. Urine, when sufficiently diluted with water, forms a food highly conductive to the growth of plants; it is, indeed, thought to contain the essential elements of vegetables in a state of solution;† but its state of putrefaction requires great attention. Thus, it may observed that, in the hot months of summer, the pasture where the urine of cattle falls becomes marked by a rich dark green when rain falls soon after; but if the dry weather continues, the developement of the ammoniacal salts, arising from the putrefaction of the urine, then occasions it to burn up the grass; yet, on the contrary, an excess of moisture deprives it entirely of effect. Thus, the whole of the urine from a dwelling-house having been daily thrown on a piece of pasture during three months of the winter, it was found in the following summer to differ but little from the state of the rest of the field—it having suffered too much dilution from the rain to be capable of putrefaction. But, in the following June, a week's urine being put into a jar, and covered with a slate, where it remained until it had completely undergone that stage, was then mixed with four times its amount of water, and, when sprinkled at proper times on the same quantity of pasture, it soon occasioned a luxuriant vegetation.* It produces similar effects on green vegetable crops—nourishing them when applied in a diluted state, but scorching them and destroying their tender herbage so effectually when unmixed, as to impede their growth. There is indeed but little doubt that nutritious manure of any kind may be carried to an excess which becomes prejudicial to vegetation, particularly in its early stages. Naismith instances the steeping of three peas for twenty-four hours in a teacupful of strong dung-juice, and three in plain water: each three were planted half an inch deep in separate flower-pots filled with garden-mould, and the liquid in which they had been steeped poured into the pots over them. Those which had been steeped in plain water appeared above ground thirty hours before the others. Both advanced, but those in the dung-juice had the most weakly appearance. When the plants were about four inches high, the lower leaves of those fed by the dung-juice fell off; and in about four weeks after, the plants died, though they were daily watered, while those to which the water only had been administered continued healthy.† The haulm of a potato, too, the growth of which was pretty well advanced, fell off soon after it had been well wetted with urine in an advanced stage of putrefaction, and even the root itself was found reduced to a pulp.‡ It is, in fact, of a scorching quality, and its application to growing crops is not advisable during hot weather, unless mixed with a large proportion of simple water: of course it will not operate in the like manner upon fallow land, and it may be applied whenever the ground is in a fit state to absorb it readily, but much of its effect may be lost if it be not laid on at the time of sowing.

There is probably no species of manure so generally neglected, and yet so deserving of attention; for although the largest portion of what is produced in most farm-yards is there necessarily absorbed by the litter, and consequently profitably applied, yet large quantities are constantly allowed to run to waste. We have no means of ascertaining the amount of urine that may be voided by different animals in the course of a day, for the diversity of their size and of the kind of food on which they are supported would deprive such a calculation, upon a broad scale, of any pretension to accuracy. It has however been supposed that, if fed upon common white turnips, they yield about two-thirds of the weight—or about a gallon for every 12lbs.[*]—besides the water which they drink; and we have seen, that the cow which we have mentioned, produced, when fed on two-thirds of brewers' grains, only 45lbs. of dung out of 125lbs. of food, the greater portion of which was accordingly voided in urine. It must also be recollected that the cattle upon the farm to which we have alluded, in Flanders, consisted of only forty-four head, of which eight were horses, fed during the greater part of the winter upon dry food, yet they not only converted the entire produce of the straw and stable-dung into well-prepared compost of the usual description, which could not have been effected without a large supply of urine; but the savings from the stalls also furnished an additional quantity of liquid manure of the richest kind, equal to the culture of exhausting crops upon 21 acres of ground. It has been calculated too, in Scotland, that the urine of six cows or horses will enrich a quantity of earth sufficient to top-dress an English acre of grass-land;[†] but, considering the trouble and the prejudice attending it in this country, it is probable that the best way of preparing it for use is that recommended by a considerable farmer in Peebles-shire, who applies it in the following manner. He has a pit, about 12 yards square and 4 feet deep, which he fills with rich earth, or any such matters that may be at hand, and the urine of the cattle which he feeds is conveyed to the pit by a sewer, and spread equally over it. After this compost has received the greatest portion of the urine, which is about the latter end of April, when it is ready for the spring sowing. it is carefully turned over, when it shows symptoms of complete saturation; and in this way a large quantity of rich manure is raised, equal to about 280 cart-loads, 40 of which, per Scotch acre, when applied to the ground, he finds equal, if not superior, in its effects to his best dung. The expense of filling the pit only amounts to £6.[‡]

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* Principes Raisonnés d'Agriculture, tome ii. § 612; and note of the translator, the Baron de Crude p. 349.

† Sir Humphrey Davy, Lectures, p. 257.

* Farmer's Magazine, vol. xx. p. 132.

† Ibid., vol. vii. p. 301.

‡ Essay on Manures: Appendix to the Gen. Rep. of Scotland, vol. ii. p. 108.

Throughout a great part of the rich low-lands in Tuscany, the manure is chiefly procured from night-soil, and preserved in large cisterns, in which it is steeped for several months in about three times its quantity of water; though some farmers content themselves with a large ditch, which is applied to the same purpose as the cistern. Into this every kind of putrescent matter is also thrown, and the putrid water thus produced is found to possess qualities of a very fertilizing nature. It is however principally used for garden ground, which is thus watered every fortnight; and the plants, but more particularly onions, thus acquire a prodigious size, without being in the least affected by any bad flavor arising from the manure. Neither is its smell, though most offensive for a a day or two after it has been laid upon the land, ever known to occason any prejudicial effect to the health of the peasantry.[*]

In a paper addressed to the Board of Agriculture by Baron Schulenburgh, one of its honorary members, he states that in Sweden the urine is collected from the farm-offices, and pumped over dung and other substances while in a state of compost. The contents of the privies are likewise regularly collected by scavengers in all the great towns, and carried, in many instances, to the distance of forty miles from Stockholm. It is then diluted with water, and laid chiefly upon meadow-land; but it is also applied to green crops, and the effects on the soil, though gradually diminishing, are generally considered to last during four years.[†]

In Switzerland, also, the *mistwasser*, or manure-water, is sprinkled over the surface of the meadows by means of large casks and perforated water-troughs, immediately after each cutting of the scythe, which makes the grass to spring up again with great vigor in a very short time; and it is well known that water, rendered fetid by the solution of vegetable or animal substances, is essentially serviceable to grass-land, as may be commonly perceived by its effects when thrown upon the fields in the neighborhood of stagnant ponds in which flax has been steeped. It is indeed highly probable that manures which are intended to act immediately upon the soil when laid on its surface, will have more effect upon grass-land when applied in a fluid state than in a solid form. It cannot, however, be denied that there are many instances on record in which no such consequences of its application have been remarked. Marshall relates an experiment conducted on his own farm with considerable care, in which the common drainage of the farm-yard—of course including rain-water—was laid upon two separate fields of young tares and clover, grown upon a sandy loam, at the rate of about 2500 gallons per acre: the liquor was of middling strength, very high colored and foul, but not puddly, and it was carried on in wet weather. No perceptible advantage was, however, observable on either those or the ensuing crops;[‡] but the weather was not favorable. Some farmers, indeed, think these washings from the farm-yards, though of a brown color, are yet, in most instances, so diluted with rain, as not to be worth the expense of carriage;[§] though other accounts of dung-water say, that, when permitted to trickle slowly upon the sward of meadow-ground, it renders the grass soft and luxuriant.[‡] In an expriment recorded in the Bath Papers, two spots of meadow were equally measured, and watered three times a week during a month together of nearly dry weather—the one with dark-colored stagnant water from a pond, and the other with clear river-water—at the end of which time, the first was far better than the other. The crop upon that part of the field which had the foul water was strong and succulent, of a deep healthy green, and 18 inches high, while the other though thick and high was yellowish, weak, and faint. On being made into hay, and separately kept, the former yielded nearly double the quantity and of superior quality to the latter; and the same effect was visible in the following year.[§] There needs, indeed no argument to prove that it must possess some fertilizing properties, but, except it be rich in quality, as well as abundant in quantity it may be doubtful whether it be a profitable object of team labor.

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[*] The weight of pure distilled water is 8lbs. per gallon: that of urine is heavier, in proportion to its composition.

[†] General Report of Scotland, vol. ii. p. 526. We cannot, however, avoid noticing the loose manner in which this calculation is supported; for the quantity of urine produced by six cows, or by the same number of horses, would be materially different.

[‡] Mr Alexander. See the Survey of Peebles., p. 169.

[*] Simonde, Tableau de l'Agriculture Toscane, p. 35. Derbysh. Rep., vol. ii. p. 209.

[†] Communications to the Board of Agric., vol. i. art. xxxi.

[‡] Minutes of Agriculture, Digest, p. 23.

[§] It is stated in the Rutland Report by Mr. Parkinson, that the black water thus drained away from manure, has been tried frequently on land, without effect. He himself tried it, by having a dunghill made with a grip cut round it, with a descent to a kind of reservoir at one end of the hill, for this water to drain into, and then had it thrown back on that end, thinking thereby to preserve the loss of strength in the manure. But he

Some extensive experiments upon the application of liquid manure—when confined to urine—have also been recently made in Scotland upon various crops, of which the following is a summary.

A cistern was constructed in the dung-court sufficiently large to contain the urine of from thirty-five to forty, and sometimes of seventy cows. The supply generally amounted to 360 gallons a week. When intended for use it was mixed with three or four times the same quantity of pond-water, and was taken out to the fields in a large butt containing 120 gallons, placed on wheels like a cart, to the hinder part of which there was attached a wooden box perforated with holes, through which the liquid ran out upon the ground in the manner of a common watering-cart.

No. 1.—When applied, in October, to *grass* which had been closely cropped by sheep,[*] the aftergrowth was not much increased, but the sward maintained a fresh green appearance during the winter, and it could be cut a month earlier than that which had not been so treated. Even in March it afforded a full bite; but should the grass be wanted for pasture, and not for cutting, the manure should not be applied later than December, as, when deferred until February, the cattle are rather shy in eating it.

No. 2.—The effect when applied to *clover-lea*, to be broken up for oats, was very perceptible; the increase of crop being about one-third.

No. 3.—For *wheat* it answers well on a light soil; but on stiff or clay land it does no good. If laid on when the land is wet, it is also of no perceptible benefit to the wheat; but if applied under more favorable circumstances, that crop would probably be increased about one-fourth.

No. 4.—To *barley* its application was found injurious; for, although the bulk of the crop was great, yet the straw was so soft and weak that it lodged.

No. 5.—*Potatoes* grew to a large size, but they were watery and quite unfit for the table; though the application of a little dung along with the urine improved their quality.

No. 6.—On *turnips* it was not found half so efficient as fermented dung.

It thus appears that this species of liquid manure applies best to grass; a doctrine which is corroborated by the experience of Mr. Harley, the proprietor of the celebrated dairy near Glasgow, who says—'that the advantages of irrigating grass-lands with cows' urine almost exceeds belief: last season some small fields were cut six times, averaging fifteen inches in length at each cutting, and the sward very thick.'[†] It was also found to succeed best after a shower, or when the ground was moist; but if laid on during sultry weather, it was advantageous to mix it with one-third of water; and although that was not thought necessary in spring or autumn, yet, judging from the quantity used, it may be presumed to have been rather profusely added. We learn, indeed, from Sir Humphry Davy, that—'during the putrefaction of urine, the greatest part of the soluble matter contained in it is dissipated.' He therefore recommends that 'it should be consumed as fresh as possible, but if not mixed with solid compost, it

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found that when the manure which came from that side of the dunghill was laid upon the land, it was weaker than the other; and he therefore concludes—'that when once this black water departs from the dung, that it is like blood let out of a vein, never to be applied again for the like purpose it was designed for in its original state.' Surv. of Rutlandsh., p. 91.

This, however, was doubtless occasioned by fresh fermentation being occasioned by the dung thus continually wetted, and thus losing its strength by repeated exhalation: but though it may be properly used as an argument for not thus applying even the drainage from manure, unless it should be in danger of becoming fire-fanged, yet that cannot be a motive for allowing it to run to waste.

[‡] Bedfordshire Report, p. 505; Buckinghamshire do., p. 275.

[§] Vol. i. p. 170. In pursuance of this experiment, the pond was drained and lined with clay, to prevent the water from oozing through it; drains were then laid into it from the stables, and into it were also emptied the contents of the privy and the offal from the kitchen, by which means the water became very putrid. A water-cart was then made, with a trough behind full of holes, and the meadow-land was watered with twenty cartsful, laid on either in the beginning of May, or after the cutting of the crop in July; the effect of which was superior, on both crop and rowen, to any other kind of manure.

Although the lining of the pond with clay was a good precaution, it might, however, be dispensed with; for, on draining the pond, the earth at the bottom would be found saturated with the drainage, and being scraped up, would make excellent manure.

[*] The account from which this was extracted says 'that the quantity allowed was 20,000 gallons per imperial acre;' but on calculating the urine at 360 gallons per week, and presuming it to have been mixed with four times the same quantity of water—as there stated—the whole amount furnished during the year would only be 93,600 gallons; yet the extent of ground thus manured amounted—

In the year 1828, to 40 imperial acres
" 1830, " 46 "
" 1831, " 50 "
" 1832, " 80 "

of which the one-half was watered again after the first crop of clover was cut in 1831 and 1832: there must therefore be an error in the quantity of urine. See the Quarterly Journal of Agriculture, No. xix. p. 95—97.

[†] Sir John Sinclair's Hints on the Agricultural System of the Netherlands, p. 63.

should be diluted with water, as, when undiluted, it contains too much animal matter to form a proper fluid nutriment for absorption by the roots of plants.' This theory, it will however be recollected, contradicts both the Flemish and the Chinese practice, which favors a protracted degree of fermentation; but he admits that 'putrid urine abounds in ammoniacal salts; and, though less active than fresh urine, that it is a very powerfull manure.'* It cannot, indeed, be doubted that, in whatever state it may be found the most effectual, it is at least well worthy of attention, and we recommend it strongly to the consideration of all experimental farmers.

Translated for the Farmer's Register, from the *Annales de l'Agriculture Francaise.*

ARTESIAN, OR BORED WELLS.

Extract of a letter from M. Mulot, Mechanical Engineer, to Count Héricart de Thury.

"I have now, sir, to inform you of a boring which I have just made at the Count Desbassayns de Richemont's, at Cangey-sur-Cher, near Tours, department of Indre-et-Loire. My labors commenced on the 14th of June. In twenty one working days we sunk 210 feet in the chalk, that is 10 feet a day on an average. At this depth we found a first spring of water which gave 600 litres† in a minute, on a level with the surface of the soil. We continued the boring below the chalk into the sand and green sandstone and at 375 feet we reached a second source, which gave 1,000 litres of water in a minute. Since then the Count de Richemont has written me that the boring having been carried to 390 feet in the clays below the sandstone and green sands, the auger has caused a third stream of water to spout forth which gives 2,500 litres in a minute. And finally, my foreman writes me that this boring is no longer an artesian well, but a torrent which vomits forth water and sand, and that the quantity may be estimated at more than 4,000 litres in a minute."

What a result! a well of 400 feet in a month, and 4,000 litres of water in a minute! after a drought which had burnt up every thing, consumed every thing, exhausted, dried up all the springs, brooks, wells, &c. I had announced to our borers that when they should have perforated the mass of chalk, they would find in the clays below the sand and sand stone abundant sheets of water, and that it would even be essential to take precautions against their rising. The boring which has just been made at the Count Desbassayns de Richemont's justifies my anticipations, and proves to us the possibility of obtaining water in this way on our extensive plains of chalk, which now offer only a hopeless aridity while they might be watered and converted into beautiful artificial meadows.

From Low's Elements of Practical Agriculture.

THE PROCESS OF SUMMER-FALLOWING, IN BRITAIN.

The fallowing of land consists of a course of tillage continued for a certain time. When it is continued for an entire season, the process is termed the summer-fallow.

A course of tillage during only a part of the season is adopted in the case of preparing land for such crops as the turnip, the cabbage, the potato, which are thence frequently termed *fallow-crops*. This preparation consists of a series of ploughings, harrowings, and other operations, continued until the land is cleaned and otherwise fitted for the crop to be cultivated.

The extension of the culture of fallow-crops has greatly lessened the necessity of the summer-fallow; for the ground receiving a good preparation for this class of crops, and they, from the wide intervals at which they are cultivated, admitting of an efficient tillage during their growth, the farmer is more enabled to dispense with the necessity of devoting an entire year to the tillage of his land.

It is chiefly on the stiffer clays that the summer-fallow may be held to be an essential branch of farm management in this country. These are tilled with greater difficulty than the lighter soils, and do not always admit of the cultivation of those particular classes of plants as the turnip, which are suited to the lighter soils, and which render upon them an entire summer fallow unnecessary. A further reason exists for the adoption of the summer-fallow on the stiffer clays, namely, that the most valuable of their productions is wheat, for which the summer-fallow affords the best preparation. The manner of performing this process, therefore, merits the serious attention of farmers in this country.

Whatever be the nature of the soil to be fallowed, the first ploughing is in all cases to be given in autumn, or before winter, so that the soil may receive the influence of the winter frosts, and the growth of weeds be checked; for certain weeds will grow during the months of autumn, and partially in winter and in early spring; but by inverting the surface, and exposing the roots of those plants, and the under part of the sod, to the frost, the vegetation is checked until the process of ploughing can be resumed in the following spring.

In all cases the first ploughing should be as deep as the plough can conveniently be made to go. A good plough with a pair of horses can easily plough from eight to nine inches deep, and this is in most cases an efficient tillage. But should the nature of the soil render it necessary, an additional force of draught must be employed, so that the requisite depth of furrow may be given. Thus, in some of the marly and tenacious soils of England, four horses may be occasionally required to give sufficient depth to the first ploughing of fallow. Three horses may be also used; these, with a good plough, forming an efficient team, which may be managed by one ploughman.

With respect to the manner of laying the ridges, that kind of ploughing must be adopted which is calculated to keep the land dry during the months of winter, this being an essential point of practice in the class of soils for which the summer-fallow is required.

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* Elements of Agricultural Chemistry, 4to., p. 157.

†More than 880 English gallons.—Ed. Farm. Reg.

A good method of preserving the land in a dry state is cleaving with open furrows. In this manner each ridge is divided into two, so that good provision is made for allowing the free egress of water.

Sometimes the ridges may be gathered, and at other times, when the land is moderately dry, they may be cast. In whatever manner the ridges are ploughed, they remain in the same state till the following spring, and care therefore must be taken that all the cross-furrows and channels shall be made and carefully cleaned out, so that no water may stagnate upon the field.

In the ordinary management of the farm, the first operation in spring, as soon as the weather allows, is the sowing of the spring-crops of corn. When this essential labor of the season is completed, which in this country is generally from the middle to the end of April, the tillage of the land intended for such crops as the turnip, the potato, and other fallow-crops, is to be resumed. But though these are the first in the order of preparation, and must necessarily be first attended to, yet the summer-fallow should not be neglected at this early season, but should receive one ploughing not later than the month of May, and the earlier in the month the better.

Now this, the second ploughing of the summer-fallow, may be done in two ways. The land may be either cross-ploughed, or ploughed in the direction of the former ridges. On the lighter and drier soils, in the cases where such soils are subjected to the summer-fallow, the cross-ploughing is the better method. But, in the case of the stiffer clays, the ploughing in the direction of the former ridges is to be preferred; for this is a provision against the effects of heavy falls of rain, which, were they to occur at this early season, when the land was ploughed, without open furrows to carry off the water, might so saturate it as to render the subsequent tillage precareous and difficult.

The next ploughing, which is to be as early in June as the other labors of the farm will allow, is to be made across. Immediately after this ploughing, the land is to be harrowed by repeated double turns, the direction of each double turn crossing that of the previous one. These double turns are to be repeated four, five, or more times, as occasion may require; and the roots of all plants which are dragged to the surface by the harrows are to be carefully collected by the hand and laid in heaps. A cart then passing along the rows of heaps, the collected plants are to be forked or thrown into it, and carried off the ground. They are to be formed into a compost by being mixed with quick-lime, so as to destroy their vegetative powers.

Sometimes these weeds are burned on the ground, and their ashes spread upon the surface: but this practice is not to be imitated, the ashes yielding an inconsiderable quantity of manure as compared with that which is produced by forming the weeds into a compost.

It is of great importance at this period of the summer-fallow, to drag to the surface and collect as large a portion as possible of the roots of vivacious weeds in the ground; for, this being the period of active vegetation, every part of these roots which is left in the ground will grow again and extend itself.

It is by the repeated action of the harrows that these roots are detached from the soil and dragged to the surface. When necessary, the roller is also to be employed. This, bruising the clods or indurated masses of earth upon the surface, enables the teeth of the harrow to act upon them. When the roller passes over the ground, the harrows immediately follow.

At this time, too, the grubber may be employed, as subsidiary to the action of the harrow.

This is a period of the summer-fallow at which all obstructions arising from land-fast stones and other impediments to tillage are to be removed; and if drains are required, it is now convenient to form them, the stones collected upon the surface being led forward at once to the drains, and filled into them in the manner to be afterwards explained.

This, indeed, is merely matter of convenience when the stones are in readiness, for the time of summer-fallow is not really the best for the forming of drains, owing to the hazard of heavy rains occurring, and carrying the soil, which is then loose, into the drains. This, however, is but a contingency, and there is convenience in forming such drains as may be needed at this time: and not only at this time, but during all the subsequent operations of the summer-fallow, draining, the removing of obstructions to tillage, and other works, are carried on. The obstructions of this kind to be removed are, generally speaking, any thing that may impede the path of the plough, and interrupt the common operations of tillage—such are the roots of trees, stones, inequalities of the surface, and the like.

It has been seen, then, that, in the management of the summer-fallow, the first ploughing is to be given before winter, when the land is ploughed lengthwise, in such a manner as that the land shall be kept dry until the tillage can be resumed in the following spring; that the second ploughing is to be given as early as possible in May, and in the case of stiff soils, lengthwise; and that the third ploughing, which, in the common course of farm-labor, we may hope to accomplish in June, is to be given across, when the principal labor of harrowing, rolling, and disengaging weeds, is performed, and when opportunity is taken to begin to drain, clear the ground of stones, and perform similar operations required.

As soon after the last ploughing and cleaning as the state of the weather and the labors of the farm will allow, the fourth ploughing is to be given. This ploughing may be performed in two ways. It may either be given lengthwise, and the land formed into ridges, or the whole may be ploughed in large divisions, without regarding ridges, as in cross-ploughing.

The former method may be adopted when the season is critical, and the land stiff and naturally wet. This is in order to avoid further hazards from great falls of rain; for, by forming the land into ridges, it is placed in a state of comparative security. But it allows of a better subsequent tillage of the land to lay it flat, by ploughing it in large divisions without yet forming it into ridges.

In this case, the land may be ploughed in a direction at right angles to the previous ploughing, that is, in the direction in which the future ridges are to run; but it will be better to plough somewhat diagonally, that is, nearly in the direction from corner to corner of the field. This is done in order that two successive ploughings may not be in one direction; for the next ploughing to be given, as we shall immediately see, must necessarily be lengthwise in the direction of the ridges. But by deviating from this direction with the ploughing now to be given, the two successive ploughings will cross each other, and thus the tilling will be better performed.

No sooner is this diagonal ploughing completed, than the process of harrowing, rolling and cleaning the ground of the roots of vivacious weeds is to be renewed, precisely as after the preceding ploughing. It is not necessary or expedient that the process of harrowing shall be carried further than is absolutely required to disengage the weeds: but to this extent it is important that it be carried, so that the land may now be cleaned.

These two ploughings, with their corresponding harrowings, are of the utmost importance in the management of the summer-fallow. If the weather has been favorable, the land may now be expected to be effectually cleaned, and thus far to be in good order. Sometimes a further ploughing may be required for the purpose of completing the cleaning process; but whether this be so or not, the land ought now to be formed into ridges. This is necessary, in order to provide against the contingency of heavy rains, which, were they to occur at this period, when the land is lying in a flat state, might so soak it as greatly to retard the future labors.

We now, therefore, proceed to strike the furrows in the manner formerly explained. The land is then ploughed and formed into ridges, and this completes the fifth ploughing which it has received. The land will generally be now ready to have the dung laid upon it. But in some cases it may require a sixth ploughing before it is sufficiently cleaned and prepared for the dung. In this case, the land being harrowed, and the remaining weeds collected as formerly, it is ploughed again in the line of the ridges.

We may proceed, however, upon the supposition that this further ploughing and cleaning are not required, and that the land, after the fifth ploughing, is ready for the application of the dung. This may bring us, in the ordinary course of farm-labor, to the month of August.

Now the dung, according to the practice before described, has been previously led out and laid in large heaps in the field, where it has undergone a certain degree of fermentation. Should this not have taken place sufficiently, the heaps must be turned, so that the dung may be brought to a fit state for use.

The dung is now conveyed to the land in carts from the heaps, the carts being driven along the ridges. It is dragged out from behind by the workman with the dung-drag into heaps, as nearly as possible of equal size, and at equal distances, in rows along each ridge. Sometimes, to ensure accuracy, the ridges are divided, by furrows run across them, into rectangular spaces, each space receiving its allotted quantity of dung. But in general the eye and practical knowledge of the workman will enable him to drag out and deposite the heaps in the quantity, and with the accuracy that may be required.

Several persons, who may be females or young lads, then spread out the dung all across the ridge, by means of light three-pronged forks. This operation should be done with much attention, so that the dung may be spread regularly over the ridge.

Close upon the work of the spreaders, the ploughs are to follow and cover the dung. This is done by gathering the ridge, so that, while the ploughing covers the dung, the curvature of the ridge is increased.

The dung being covered in this manner, and the ridge raised, the land is to remain untouched for a few weeks, so that the dung may be decomposed and incorporated with the soil. When the dung has been previously fermented in a proper manner, this incorporation will be completed in a very short time.

The land is now ready to receive what is called the seed-furrow, which is the ploughing given to it previous to the seeds being sown. In this ploughing the ridge is again gathered, but the ploughing being very shallow it has little effect in raising the ridge higher.

After this final ploughing, and upon the surface now exposed, the seeds, usually of wheat, are to be sown, in the manner to be afterwards described. This generally takes place about the middle of September or later, and completes the important operations of the summer-fallow and sowing of the wheat-seeds.

In this detail the manner of applying the dung has been described; but there is likewise to be considered the manner of applying lime, when this substance is to be laid upon the land in summer-fallow.

There are two periods at which the lime may be applied—either before the dung is laid on, or afterwards. In the former case, the lime may be laid on just after the land has been formed into ridges, and when it is ready to receive the dung.

The quicklime, as it is brought from the kilns, may be laid down in heaps of about five carts each, at regular distances, upon the head-lands or where convenient. In this case, it is brought to the farm as opportunity offers, and slacked slowly and regularly.

When we are prepared to spread it upon the ground, a person with a broad-pointed shovel is appointed to each heap. He fills his cart, drives it along the ridge, and spreads the lime abroad upon the surface, taking it out with his broad-pointed shovel from the cart behind; sometimes two carts and two men may be appointed for each heap, the one man filling the cart at the heap, and the other spreading the lime upon the ridge.

Both men and horses sometimes experience injury from the caustic effects of the lime, especially when the weather is moist. The face of the man may be defended by a thin handkerchief, and the back of the horse should be covered.

When the lime is spread, the land must be immediately harrowed, to incorporate the lime with the soil. This being done, the dung is to be spread upon the ground, and covered by the plough in the manner before described.

But frequently the dung is first spread, and the lime is not laid on until just before giving the seed-furrow. This answers very well, provided the land has lain a sufficient time after the dung has been spread, so that it may be decomposed and mixed with the soil.

These details have an especial reference to the stiffer soils, which are those on which the summer-fallow is generally practised. When the lighter soils are to be fallowed, the process of cleaning is more easy, and there is less hazard of serious interruption from the state of the weather. The only variation with regard to the lighter soils that need be referred to, is in the first spring-ploughing. In the case of such soils, this ploughing may be given at once across, and the process of harrowing and cleaning then commenced. This is precisely the management pursued in the case of turnips and similar fallow-crops; so that, when the learner comprehends the operations of the summer-fallow thus far, he is acquainted with the manner of preparing the land for an extensive and important class of plants.

In the preceding detail the ordinary operations of the summer-fallow have been described, but the nature of the seasons, the state of the land, the prevailing weeds to be eradicated, and other circumstances, produce variations in the course of management, which, however, it is not necessary here to point out. They are little subject to rule, but are best determined by the judgment of the farmer, as the cases themselves arise. A more important purpose is served to the student of agriculture by pointing out to him the manner of managing the summer-fallow upon approved principles. Knowing this, a little experience will soon show him how to adopt those variations of practice which the state of the season and other circumstances may render expedient.

The process of the summer-fallow, conducted as it should be, enables us to effect the tillage of clay-lands in a manner calculated to eradicate weeds, and fit the land for bearing a lengthened rotation of crops.

After a complete summer-fallow, the land is seen to be in the best order which circumstances will allow. It acquires that mellowness, indicative of fertility, so familiar to the eye of the farmer, yet so difficult to be described. It is frequently observed by farmers, that clay-lands in this climate get into an adhesive, and, as it is termed, a sour state, by the long repetition of crops. The giving them from time to time the mellowing influence of a summer-fallow, during which weeds may be extirpated, and the manures applied in the most beneficial manner, is found to have the best effects in restoring the fertility of the soil and fitting it to yield an increased produce in succeeding years. One advantage, too of the summer-fallow, not to be disregarded, is, that it divides the labor of tilling a farm more regularly throughout the season.

From the (Boston) Horticultural Register.

ON THE ROSE.

Much has been written both in poetry and prose on this subject, yet it remains not only inexhaustible, but interesting; and what is still to be written is almost sure to find readers. It is true the plant is in itself almost inexhaustible, as there are two hundred and five known and described distinct botanical varieties, and nearly *two thousand* named sorts raised from seed: its cultivation comprises almost every refinement in horticulture, as it is propagated by most known methods of increasing plants, by seed, cuttings, layers, suckers, and budding. New and beautiful varieties are constantly produced from seed. Some species are hardy, others tender; some are difficult of cultivation, while the chief part require little care, and are therefore universally known and dispersed; the early monthly roses usher in the spring; during the summer their beauties are spread in profusion throughout the garden, and the Noisette with many others still linger and adorn the autumn, until the stern hand of frost arrests each vegetable form: even then they yield their charms to the ingenious hand of luxury, and ornament the green-house.

Their delights are not very evanescent; equally conspicuous in bud, in full perfection, and in fruit; add to these their unequalled fragrance, the chaste brilliancy of their tints, the wholesome medical properties of the whole rosaceous tribe, and we must cease to wonder at the general interest excited them, or that a unanimous voice has proclaimed the rose to be the queen of flowers, and that all hitherto written, said or sung in its praise, is received with attention by those who pay the homage justly due to the most beautiful of the vegetable creation.

There is something of passion mingled with our sentiments for the rose; we admire the beauty, or are struck with the magnificence or singular forms of other blossoms; but when we view the delicate, tender tints of the expanding bud, and enjoy the dilicious fragrance of the full blown flower, we can scarcely help feeling that we *love* the rose.

Botanists have divided the tribe of the roses into eleven sections.

1. *Simplicifolia.*—Simple-leaved, without stipules, (a leafy appendage at the base of the leaf or leaf-stalk,) the berry bristly. Of this there is only one species, a native of Persia, commonly called the berberry-leaved rose; this will explain what is meant by simple-leaved.

2. *Feroces.*—Fierce—from the very numerous thorns which cover the branches. Of this there are three species, one from Japan and two from Kamschatka; one of these latter, we have seen in gardens in this vicinity.

3. *Bracteatæ.*—With bracteas, (small leaves on the flower-stalk under the calyx.) Of this there are four varieties, amongst which are the well known *R. microphylla* and the *Macartney rose;* the foliage of these is shining and very beautiful; the fruit woolly.

4 *Cinnamoneæ.*—Character agreeing with the Cinnamon rose. Of this there are twenty-one varieties, including *Rosa lucida*, which ornaments the swamps near Boston with its flowers and dark fruit, and the Cinnamon rose, so common near cultivated grounds in this vicinity.

5. *Pimpinellifolia.*—From the resemblance of the leaves to those of the *pimpernel* or anagallis. To this section of forty-two varieties, belong the yellow American rose, *R. lutescens*, of Pursh, the sulphur-colored rose, the celebrated Scotch rose, *R. spinosissima*, of which above one hundred and seventy seedlings are named in catalogues, *R. stricta*, a native of New England, and probably several others, which have been of late years discovered in Kentucky and in other

parts of the Union, and described by Rafinesque. This section may also be readily distinguished by the numerous leaflets, generally from seven to fifteen in number.

6. *Centifolia.*—Characters agreeing with what is usually called the hundred leaved rose. To this section of ten varieties belong the moss, the hundred leaved, the damask, and R. gallica; consequently, also, great part of the multitude of garden varieties before mentiond, which have been raised from seed.

From the damask is probably obtained most of the essential oil called attar of roses. If those who distil rose-water would leave it immediately after distillation in large shallow pans for two or three days, they would find an oily film on the top, which may be skimmed off with a feather, and the feather cleaned with a little warm water—this is true attar. In many parts of the east it is manufactured by throwing large quantities of rose leaves into shallow tanks filled with water; after some weeks (depending on the heat of the weather) the oil rises to the top, and is removed for sale. This section may be distinguished from the others by the plants bearing bristles as well as prickles, and by the pieces of the calyx called sepals being divided.

7. *Villosæ.*—Villous. Closely covered with long soft loose hairs. The white rose, *R. alba*, is included in this section, which therefore contains some of the most beautiful of the tribe; for instance, the *celestial, nova cælestis* (new celestial,) *bouquet blanc, boule de niege* (snow-ball,) *maiden's blush*, and thirty or forty others. The most distinguishing character of this section, is the straightness of the prickles, as in several varieties of the white rose the villousness is not very apparent without the microscope, the hairs being short and adhering close to the stem; the prickles, however, are to be considered as comparatively, not mathematically, straight.

8. *Rubiginosæ.*—Rusty. The under side of the leaves being generally more or less covered with brown, rusty-colored glands. To this section belong the delicous scented sweet-briers, the true Eglantine of the old poets, of which sixteen garden varieties have been enumerated, one of them mossy. The native sweet-brier is called by Pursh *Rosa suavolens;* Rafinesque and Bigelow call it *R. rubiginosa.* One of the section, *R. caryophyllacea*, a native of Podolia, Volhynia and Iberia, has a strong clove scent. A distinctive character of this division is the arched growth of the suckers; this must have been often remarked in the two years old shoots growing near Boston; also, the sepals (pieces of the calyx) are permanent, that is, remain on when the fruit is ripe.

9. *Caninæ.* Characters agreeing with *Rosa canina*, the dog rose. To this section belong not only the most numerous and common ornaments of the hedges in Europe, but also those valuable sorts the Chinese rose, R. indica and its var. odoratissima, the tea rose; likewise var. Noisettiana, the Noisette rose, with its delightful clusters of blossom. *R. semperflorens,* the everflowering China rose, and *R. pseudo indica*, the yellow Indian rose, are included in this division. I have the names of nearly fifty garden varieties of this section, the chief characters of which are the smoothness of leaves, the prickles hooked, and the peculiar and grateful flavor of the pulp of the fruit, which contains citric acid, and is often made into a conserve by boiling, or baking with sugar.

10. *Systyla.*—From two Greek words, alluding to the styles being connected together into an elongated column. In this section are included all the climbing roses, as *R. sempervirens*, which in Europe is evergreen. I have never seen it here; the fruit is of an orange color, it grows rapidly, and soon covers a trellis with its numerous and fragrant flowers. Of this, the var. *roseclare* has large spreading corymbs of deep red blossoms, and is most probably a hybrid between this and R. indica. *R. multiflora*, of which the Boursault and Greville are varieties, also belongs to this section, as does *R. moschata*, from which it is supposed the Persian attar of roses is made; the flowers have a slight odor of musk. The bramble-leaved rose, *R. rubifolia*, a native of this country, is also to be faund in this division.

11th, and last, is *Banksianæ.*—Characters agreeing with the Banksia rose. The species of this section are distinguished by their long graceful, and sometimes climbing shoots, their drooping white and tinged flowers, and shining leaves of three or at most four leaflets; to it belong the native *R. setigera* of Michaux, the *R. lævigata* of Georgia, and several natives of China, one of which, *R. hystrix*, has purple fruit, and another, *R. fragrariflora*, has flowers in corymbs of the size and color of the strawberry.

There remain about forty or fifty varieties, which have not been sufficienrly examined to be yet to be classed in any of these sections; several of these are natives of North America, and particularly of Tennessee and Maryland.

To raise new varieties from seed, as is practised in France and Italy, is rather a tedious affair. Plantations are made, in which the varieties from which hybrids are desired are promiscuously planted, for the purpose of impregnation; the fruit or hips are ripe in October and November; the seeds may be separated by rubbing them in dry sand; they may be sown the following spring in a rich, damp, shady place; the hard shell will not, however, be sufficiently decayed to permit the seed to vegetate until the spring ensuing. The year after, they may be removed from the seed bed into rich, moist soil, protecting them carefully during the winter with litter and pine boughs. The third year; some will blossom, but the majority not until the fourth and fifth year. By something like this process, innumerable varieties have ben raised by M. Villaresi, of the Royal Gardens at Monza, in Lombardy, where there is a large shrubbery entirely of Magnolia grandiflora, and by many celebrated gardeners in France, as Messrs. Noisette, Cels, Soulange Bodin. In England, the climate is hardly warm enough to ripen the seed; consequently little has been done there, except in Scotch roses; but in this country there is ample opportunity of raising new and splendid varieties, and I trust the public will not be backward in encouraging the efforts. I am not acquainted with the exact method adopted by Messrs Winship, but think several of their seedling roses, exhibited this summer at the Horticultural Society's rooms, equal to many imported.

There are several good private collections of these seedlings varieties in the vicinity of Boston. The best I have yet seen is that of M. P. Wilder, Esq., of Dorchester, who certainly seems to have spared no pains or expense in importing the choicest sorts; among them was a budded tree rose of *Mousseuse delafleche*, so conspicuous for the long moss which decorates the midrib and edges of the leaves, although the flower is small and only semi-double. There is another of this small-leaved moss variety in France, with a striped flower, (*Mouseuse panacheé*) which is worth growing. His striped unique rose, also budded on a tree, is the most perfect and charming of the tribe. The Mexican, Admirable borde rouge, Bobilina, perpetual Philip 1st, Le jeune Henri, Casimer Perier, Palavicini, and may others afforded me the highest gratification. I trust this gentleman will find leisure another season to form a regular Rosarium, where the flowers and habits of each variety may be studied at ease. The occupation of raising new varieties from seed, is almost as exciting as gambling in a lottery, particularly after being once successful in drawing the prize of a superior flower, and dedicating it to some person high in our esteem; I scarcely need add, how much more innocent, how much less liable to bitter regrets.

The easiest and quickest method of procuring a good collection of roses is by budding; the shoots produced from which will, if properly managed, generally flower the succeeding summer. This operation, called shield budding, is very simple, and performed as follows: In August, choose a sound branch of a rose-bush of that year's growth, and make an incision with a sharp knife through the bark in the shape of a T; raise up the bark forming the edges of this incision from the wood with the nail, or better with a piece of smooth shingle: take a bud from the rose you desire, in the following manner—cut a slice out from the branch about an inch and a half long, and half the thickness of the branch, so that a bud may be about the middle of the slice; with the nail gently remove the woody part, leaving nothing but the bark and the bud, which must be distinctly visible in the bark, so that it is certain it has not separated with the woody part; insert the piece neatly under the incision; after insertion, cut the bark on which the bud is, so that the top fits exactly and closely with the top of the T, and tie up the wound with bass, not too tight. In about three weeks the adhesion of the bud to the stock will be complete. If it is desirable for it to shoot and make wood the same season, all shoots and buds below the operation must be removed, and the branch headed down, leaving one shoot above the bud inserted, to draw up the sap. This is desirable when a slight protection can be given during the winter, because by cutting down the shoot from the bud to two eyes in April, it is almost sure to have many flowers that summer. I pursued this plan last year with four plants—one a bud from Rosa Grevillea. I transplanted them into pots in October, kept them in the cellar during the winter, and then plunged them into the open ground the beginning of May, where they flowered in profusion. There is a difference in the stocks on which to perform this operasion of budding; the French, who excel in it, generally bud on a tall, strong sucker of a single wild rose, for the purpose of making a tree six or seven feet high, with a head of flowers; and these are exceedingly ornamental, dotted about in low shrubberies; but I have budded with great success on bushes of the common *semi-double white*, and on the *maiden's blush*. Last April, I transplanted from the woods two strong suckers of the common sweet-brier, six and seven feet high, and budded with *celestial*, *moss*, *single yellow* and *provins*, which have all succeeded, although they have yet made no shoots. I am told that they will not last more than two or three years, and that in their native situation they only endure this period: this is in some measure true; yet I have never seen one dead, without seeing a thriving young sucker by the side of it, which has evidently drawn away all the sap of the root, and left its predecessor to perish. Now one universal rule with these budded trees, is to keep them free from suckers, or they will quckly die; this is, therefore as true of the wild rose in England and in France, as with the sweet-brier here. But there is one point I have observed, both with the imported tree roses and with the sweet-brier stocks, that requires much attention—the bark when once wounded, even by roughly tearing off a thorn, seldom heals; the wound enlarges, and finally the brown and dead bark increases so as in a few seasons to become an irreparable injury. Whether this may be cured or stopped by covering the wound with a composition has yet to be tried. The Boursault rose, if tied to a trellis, is also an excellent stock on which to bud, and seldom fails.

Mr. J. W. Russell, of Mount Auburn, observes that to be successful in flowering the yellow tea rose, it is better to bud it on a young healthy multiflora or Greville rose, and at the time of heading down to re-pot it in a mixture of one half good fresh loam, the remainder leaf soil with a portion of sand, observing to give the pot a good drainage.

The most common method of propagating roses is by layers; that is, cutting a shoot half through and pegging it down, where cut, below the surface of the soil, bending up the end of the shoot; this operation is generally performed after the blossoms have ceased: but if a sacrifice be made of the blossoms, and they are layered early in July, and the flower buds be removed, they will make plants fit for removal the following spring; otherwise, they must remain one season in the nursery beds. The moss rose is more difficult to root than most others, and in this climate more tender. I have imported several; those protected lived, the others perished. This method of layering may likewise be adopted with shoots of roses budded, and thus the variety obtained with its own root, instead of having merely the budded stock, the tenure of whose existence is rather uncertain.

Many sorts throw out suckers; these may be removed at once in autumn, or in this climate better in the spring, heading them down to about three or fonr inches high.

The common monthly roses, *R. indica*, which include the dark red variety *sanguinea*, are best propagated by cuttings, which strike readily if taken off at a joint where the wood is beginning to ripen, and planted in sandy mould under a hand glass, or even without, if kept in the shade.

The French are generally considered to excel in the cultivation of the rose. The greater proportion of the soil used there is a rich, stiffish loam, with some manure; this composition is very retentive of moisture. Where this cannot be readily obtained, mulching the roots with decayed leaves and dung is restored to. The pruning as practised in Europe, would hardly suit here, but should be deferred until the spring, just when the buds are beginning to swell; then, for bush roses, cut out all the old wood and every shoot to within six or eight inches of the surface of the soil; this materially strengthens the new shoots, and increases the size and beauty of the flowers; it also presents less space for the insects to deposite their eggs, and if the cuttings are burned, destroys many already laid. Climbing roses must only be thinned out from the wiry, straggling branches, and shortened a little, nailing or tying them neatly to the trellis which forms their support.

To prolong the bloom, pick off every flower, with the fruit attached, as soon as it has passed its perfection; this enables the other buds to come forward, and prevents their turning yellow and perishing.

The insects which attack the rose are chiefly a little brown grub, which eats into the buds—this can only be removed by picking; and the aphis, or green fly—a syringe and tobacco water will destroy these, and even plain water, if frequently applied, will cause such disturbance among them as to prevent much mischief.

The rose can hardly be placed any where without being ornamental: but having myself planted them as a hedge crowning a semicircular bank which terminated a lawn, and kept them cut low, so that the numerous blossoms reclined on the well-mown grass, I cannot but recommend this style. It may be also put in practice to form edgings round oval or circular beds of flowers or grass plots. A thick hedge of well-mingled sorts is always beautiful; and the effect may be prolonged by the old method of rubbing off the buds of every other plant as soon as they appear; later shoots will then be formed, which will only flower when their neighbors have finished. A hedge of of this description on the grass banks surrounding most of the houses in the country, would have a very delightful appearance.

J. E. T.

From the New York Farmer.

MONMOUTH AND MIDDLESEX AGRICULTURAL RAIL ROAD. SQUANCUM MARL.

The legislature of New Jersey, at the session just terminated, incorporated a company to construct a rail road from the Delaware and Raritan canal, at or near Scudder's mill, (which is near Princeton,) to the village of Freehold, (the county town of Monmouth,) from thence to the marl beds on Manasguan river; also a rail road from the village of Freehold to the tide waters of Raritan Bay, at Middletown Point, with a capital of $500,000, and a privilege of commencing the work when $85,000 shall be subscribed: and providing that the road shall be built within ten years. These will be strictly agricultural rail roads, and the transportation of the valuable marls will furnish the largest item of their income, although the transportation of mineral coal, lime, lumber, merchandise, passengers, and agricultural produce of various kinds on said roads, will be considerable. Time will not now permit me to go into a detail of the many benefits to be derived from the construction of these roads; and for the present I can only advert to a few facts, and make further particulars the subject of another commumucation.

A report of a Geological Survey of New Jersey, authorized by the legislature, and made by Henry D. Rogers, Professor of Geology and Mineralogy in the University of Pennsylvania, has just been published, from which I shall give you some extracts, to show the astonishing fertilizing properties of the marls to be transported on these rail roads: "The high, and deservedly high, name which the Squancum marl now boasts, was an inducement to me to subject it to chemical examination with especial care and rigor." "At the pits, which are very extensive, the marl is sold at the rate of 37½ cents the load. It is transported in wagons to a distance, in some directions, of 20 miles, and retailed, when hauled that far, at the rate of 10, or even 12½ cents per bushel—being very profitably spread on the soil at the rate of 25, or even 20 bushels to the acre. The fact that so small an amount of this marl is found efficacious to the soil, which, after two or three dressings, is permanently improved, and to a high pitch, by it, furnishes me one consideration for supposing too generally the marl is spread with a prodigality surpassing all the necessities of the land.

A specimen of the marl from Thrap's lowest layer, yielded me, after reiterated trials, uniformly about the following for its composition:—

Silica,	43.40
Protoxide of Iron,	21.60
Alumina,	6.40
Lime,	10.40
Potash,	14.48
Water,	4.40 in 100 grains.

"The quantity of potash is so remarkably great, that I have been led to assure myself of the true proportion by several analyses, proving the results by adopting different modes of separating the potash."

When these rail roads shall be made, vast quanties of this marl may be transported to distant places on the Delaware and Raritan Canal and the waters of Raritan Bay, the Hudson and East Rivers, and afforded on any of the landings within 50 or 60 miles of New York, for about 10 to 15 cents per bushel, and I consider it decidedly more valuable than leached ashes.

CINCINNATUS.

From the Genesee Farmer.

GEOLOGICAL SURVEY OF THE STATE OF NEW YORK.

Agreeably to a resolution of the assembly of last year, the Secretary of State has made a report in a relation to a geological survey of the state. He had been requested to report the most expedient method of obtaining a scientific and perfect account of its rocks, soils, and minerals, and of their localities; a list of all its mineralogical, botanical, and zoological productions with specimens; and an estimate of the expenses, including the cost of publishing three thousand copies of such report, with drawings and a geological map. We consider it a very able state paper.

The great importance attached to such investigations may be better understood by some of our readers, if we refer to the munificence of Stephen Van Rensselaer, who employed Professor Eaton, with assistants, four years in making a geological and agricultural survey of the district adjoining the Erie Canal, besides being at the expense of various other examinations of great extent. This was performed twelve or fifteen years ago. Since that time Massachusetts, Tennessee, the two Carolinas, and Maryland, have either caused or directed geological researches to be made within their respective limits; and Virginia, New Jersey, and Pennsylvania have the subject before them. With these examples in view, we hope "the Empire State" will not prove recreant in the cause of science and practical utility, when her ample means so fully enable her to develope her own resources. The discoveries which her geologists may make, would be only a part of the benfits to be derived from this enterprise. Hundreds of her citizens would be stimulated to make closer observations; and when explorations shall be conducted in the broad light of science, we shall hear but little more of fortunes wasted in searching for minerals, or of the fruitless toils of the miner.

A few years ago £80,000 sterling were expended in searching for coal at Bexhill, in Sussex, England, "when," as Sir J. W. Herschell observes, "every geologist would at once have declared it abortive." "Mr. Townsend informs us," says Malte Brun, "that a pit was sunk for coal to the depth of six hundred fathoms at Bruham, near the chalk hills of Bradley Nole, and that the miners reached only to the uppermost beds of the great oolite." The history of mining operations in England abounds with such examples. It may be mentioned on the authority of the last writer, that the commissioners of the Bath road, sent ten miles for flints, while their wagons actually passed, without their knowing it, over a bed of flints for the greater part of the way. The stone of which the Bath Cathedral is built, was conveyed from the distance of four miles; it was not then known that the same stone might be obtained in the immediate vicinity; quarries have since been opened. If errors of a like nature are now less frequently committed—if pits are not so often sunk in vain—it is because practical men have availed themselves of the discoveries of geologists.

To these statements we may add the expensive attempt to procure salt water on the south shore of Lake Erie, in the neighborhood of Portland, which any geologist acquainted with *the dip of the strata* would at once have pronounced hopeless.

The Secretary proposes to divide the State into four districts. The first to consist of all the counties lying to the south or east of Delaware, Schoharie, Schenectady, and Saratoga, which are also to be included—containing 12,263 square miles. The *second* district to comprise the counties of Warren, Essex, Clinton, Franklin, Hamilton, and St. Lawrence—containing 9,692 square miles. The third district to include all other counties adjoining the Erie Canal and lying north of it, to the west bounds of Genessee and Orleans—containing 12,293 square miles. The *fourth* district is to consist of the remaining (14) counties, which are estimated at 11,594 square miles.

To each of these districts, it is proposed to appoint two geologists and a draughtsman, and one zoologist and one botanist for the whole state, each to be accompanied by a draughtsman. It is supposed that four years will be required to complete the survey; and the whole expense, including that of publication, is estimated at $104,000. A lower estimate, however, has been made on the suggestion of confining the examinations to geology; but we must indulge the hope that our legislators on this occasion, will act with a liberality worthy of themselves and of their country.

FINE WHITE MARBLE DISCOVERED NEAR GASTON.

A bed of beautiful white marble has lately been discovered near the Roanoke, and only five miles from Gaston, on the great railway route from Raleigh to Petersburg. The marble was exposed to view by the digging of a well. Together with the information of this interesting discovery, we received from Charles F. M. Garnett, Esq. a small specimen of the stone, which was polished by Mr. Davidson of Petersburg, an intelligent workman in marble, and who gives a very favorable report of the specimen, though stating that it was too small to indicate the value of large masses. We hope soon to have the means of giving a decisive report of the quality, and value of the marble. If the bed should not be too expensive to be quarried (on account of lying deep,) it will prove of much value to the adjacent country, even if used for no other purpose than to burn into lime for manure. Such a business, properly prosecuted, in such a locality as between Gaston and Raleigh, would furnish to the Railroad the conveyance of an immense amount of a new commodity, lime, and afterwards the additional quantity of crops which the lime would produce through all future time. We hope that the railroad companies will see that their own interest would direct that the conveyance of manures should be charged as little as possible—and that they will not imitate the short-sighted and stupid policy of the Virginia Legislature in imposing tolls on manures on the James River canal, which act as prohibitions on their transportation. To prevent or discourage the passage of manures on a canal that must receive the tolls on all future products of such manures, is truly a specimen of policy which, though it may have many equals in the code of Virginia, is such as ought to be expected only in the legislation of such countries as Egypt or Morocco.

The foregoing notice was in type several weeks ago, but was "crowded out" of the last No. by other matters. We have since received other particulars of the marble near Gaston, in the following communication. Similar notices from persons who have ascertained the existence of any newly discovered, or valuable geological feature in our country, would render much public service, by making known resources for improvement or profit, that are now scarcely, if at all, known.

SOME OF THE GEOLOGICAL FEATURES OF THE REGION SURROUNDING GASTON, ON THE ROANOKE.

Gaston, N. C., April 12th, 1836.

Believing that the geological features of this part of the country would be interesting to you, I have concluded to advert to a few of the formations that occur near the falls of Roanoke river, near Gaston. The most interesting is a deposite of pure white statuary marble, on the lands of Wm. M. West, discovered in digging a well in his yard. The well is 36 feet deep, and the bottom of it is a solid stratum of the marble of which I have a specimen, a part of which has been shown to a lapidary who agrees with me in opinion as to the kind of marble. The breadth of the stratum we have not been able to decide, or its thickness—its direction, we think, for several reasons, is from north-east to south-west, coinciding with the general direction of all the different strata of rocks in this section of country, that I have examined. That these strata are in several places cut across by whinstone dikes, I do not consider an exception. This marble occupies the summit ridge between the waters of Roanoke and Tar river. The only other indication we have seen of it, is also on the summit ridge extending in a south-west coast from Mr. West's. I regret that the discovery of the marble is too recent to enable us to examine it thoroughly. On the same summit ridge, about two miles from Gaston, a fetid limestone and marl, with minute shells embedded in both, are found about sixteen feet from the surface, in a north-east course from Mr. West's. The discovery of this deposite is also recent, and no trial has been made of it in agriculture. It seems to be about five or six feet thick; and was perforated in digging a well. If the marble exists below it, as is not improbable, it was not reached.

Next to these two deposites of limestone, which are in a line from north-east to south-west, and not more than a mile higher up the river, is an interesting deposite of clay slate on both sides of the Roanoke, and running parallel to the same direction, from north-east to south-west; but only shows in the river valley, and dips under the hills on both sides, before it gets near the summit ridges that divide the water courses. The same stratum of clay slate is exposed a few miles north of Meherrin, in the lower part of Brunswick county, and not more than eight miles above Hicksford, and is there called the "*Pencil* Hill," from the slate being used for pencils, and answers the purpose very well. The deposite on the north side of Roanoke is much more valuable however, making the finest whetstones I have ever seen, except the oilstones, and are but little, if any, inferior to them, for carpenter's tools, hones and whetstones of every kind, where a fine edge is required, and expeditious sharpening. Some of it is, however, too soft for that use, but there is an abundance of the hard for whetstones to supply any demand. Both above and below these deposites, for three or four miles, in almost every stream, gold is found, but as yet to a limited extent. The best indications are on the south side of the river opposite to Gaston. Gold has also been found in some streams on the north side of the river, nearly opposite the deposites on the south side. These deposites on both sides of Roanoke, range north-east and south-west, with the richest deposite mine in North Carolina known here as Portis's mine near the corners of Nash, Warren and Halifax counties. Immediately above the deposite of clay slate, commence the chalybeate springs, of which there is one about two miles from Gaston on the north side of the river, and another seven miles higher up the river; and two wells have been dug not far from the first mentioned spring, the waters of which could not be used for domestic purposes on account of the large quantity of iron in them, producing the well-known effect of turning black, when any vegetable acid is put in them. These springs also range north-east and south-west with the chalybeate springs near Warrenton, known as Shocco, Parson's, and Kearney's springs—and in the intervening country are several others. All of these springs, as well as those near Gaston, have been frequently used with advantage by persons in feeble health, particularly when recovering from autumnal attacks of fever.

On the hill out of which the spring nearest to Gaston runs, is a considerable deposite of iron ore; being an oxide of iron, most of the specimens found on the surface consisting of small round pebbles cemented by pure oxide, and sometimes presenting the appearance of puddingstone or sandstone, according as the pebbles are large or very minute. Some of the specimens at the surface, however, are rich in ore, and no doubt would be richer below the surface, showing plainly the sources of the chalybeate waters. Ascending the Roanoke river, two or three miles from the clay slate strata, we come to very fine quarries of gneiss and granite on both sides of the river—stone on the south side being now worked for the Weldon bridge, and having formerly furnished most of the stone for the locks on the Weldon canal, and being to all appearance inexhaustible. This formation constitutes, probably, the bed of the river at Gaston as the soundings give rock all the way across, and it is found in the hills on each side. Still ascending the river, two or three miles further, we find a stratum of mica slate and large masses of granite. Perhaps it is proper to observe that a narrow whinstone dike crosses the river near Gaston, and crosses all the strata running nearly north and south. While on this subject, I will mention that I understand coal has been found in Granville county about 30 miles higher up the Roanoke than Gaston, but to what extent I am not informed.

If these few crude observations are worth your attention, you can use them as you think most useful.

EDMUND WILKINS.

P. S.—I have confined my remarks to this district of country, as I consider it interesting, and it is the only one in our State with which I am sufficiently acquainted by observation to speak with accuracy.

E. W.

From the Daily Advertiser.

MANUFACTURE OF BEET ROOT SUGAR.

We are indebted to Mr. Isnard for the following interesting communication, accompanied with a number of documents, which we regret that we have not room to notice at the present time, any further than to say that they fully confirm the statements contained in the letter.

Boston, March 28th 1836.

To the Editor of the Daily Advertiser:

Sir—If you should judge the present communication worthy of attention, it is at your disposal

In order to satisfy yourself concerning the authenticity of my statemente, I subjoin documents for your perusal, when at leisure.

The manufacture of sugar of beet has ceased to be an object of ridicule; the advantages that France draws from it are palpable and great, and the benefits which the manufacturers derive from it are now such that the French Minister of the Treasury has proposed to lay a tax upon it. France owes this new branch of industry to that great man whom she will honor through all times; for had it not been for his sagacity and powerful assistace, it would have shared the fate of many other improvements lying for ages, or dying in their infancy, once pronounced by ordinary men visionary projects.

The discovery that beet contains a perfect sugar, remained for over sixty years without any useful application; many attempts, however, had been made to derive the benefit of it; but those having made these attempts, being rather men of science than men of business, having operated only upon a small scale, with purely scientific views, and having made no calculations, either of expenditures or results, they had no ground to proceed upon. I undertook to solve that problem, and to that effect made the first, in France an experiment on a large scale, and by a sufficient reward induced a chemist to assist me.

The result of this experiment was transmitted to Napoleon on the 19th of March, 1811, and by his order rendered public; and though the birth of his son took place on the 21st of the same month, on the 25th following appeared the decree, a copy of which is among the subjoined documents. By this decree, as you will perceive, he created six experimental factories for the manufacturing of sugar, he appoints me the director of one of them, which factory he gives to me in property, as a reward for my labor, and for having *(perfectonné)* improved the process for obtaining the sugar of beet. Such was my zeal, that my factory in the fall of 1813 was prepared, and all the beet raised by me or contracted for, so as to produce 1,500 lbs. a day of brown sugar, and the same refined. The first entry of the allies into France caused the total ruin of my establishment. Up to 1816 political events were unfavorable for sugar making. but from that year this manufacture was resumed, and has since never ceased to increase and improve; it is now computed that over 300 such manufactories exist, producing together yearly about from 18 to 20 millions of pounds of brown sugar.

Now, sir, since the making of sugar of beet begins to attract the attention of some agriculturists of this country, I deem it of interest for them, and to gratify the curiosity of others, here to state what were the calculations made in France in 1832, (the latest date of my information) and add a few observations respecting the benefits one may derive by the mere culture of beets in this country. It is generally admitted, viz:

That one ton (2,000 lbs.) of beet delivered at the factory costs	$3.
That the expenses to work one ton of beet for obtaining its sugar,	$4.
That 2,000 lbs. beets will yield 100 lbs. brown sugar, costing	$7.

Thus one pound of brown sugar, good quality, costs 7 cents.

By a comparison of the expenses of culture in various parts of France, and on various soils and situation, the average expenses of cultivating there the extent of an American acre of land, are as follows: Rent and taxes $5.60; ploughing and harrowing $2.88; manure $1.93; sowing 50 cents; weedings and hoeing $2.40; gathering $1.60; carting $1.56; farmer's profit $4. Making a total of $21.46.

The produce varies according to the quality of the soil, the quantity of manure used, and the care bestowed on the culture—as we have taken the average of the produce, which is of 7 tons. Some yield as much as 15 tons.

The four dollars profit the French farmer derives from this culture, on every acre, is far from being the only one; the others are:

1st. The good state in which the field is left after gathering the beets—no further manure being wanted for the succeeding crop,- which crop experience has proved to be always more abundant and of a better quality when succeeding the culture of beets; owing to the destruction of the noxious weeds, caused by weeding the beets when young, and prevented from growing, by the thick foliage of the beet when strong.

2d. The facility afforded the cultivator to apply to the culture of beet, lands which he formerly let lie fallow, and consequently, without any additional expenses of rent and taxes, deriving as good a revenue from this land, as from any other producing the most.

3d. The advantages the cultivator derives by the purchase from the manufacturer, of the pomace of beet at a price not higher than beets, when experience has proved this pomace is worth for him fifty per cent. more; for in fact it is after all but beet—deprived of two thirds of water, and consequently a more nourishing food for his cattle, perfectly fitted for fattening them, producing wonders in that respect; which could not be expected from beets in their natural state.

The following is a statement of the receipt and expenditnre of a sugar establishment, as reported to the Society for the encouragement of manufactures in France. The whole work was performed in 91 days.

Purchase of 500 tons of beet delivered at 3 20,		$1600 00
1638 days' work of men at 20 *sous* 455 do. of women at 12s. 364 do. of children at 5s.		400 40
For extra work during the night,		109 20
40 cubic feet wood for fuel daily, (28 cords 3-100 at $16 7100 per cord,)		473 20
Sundry materials for manufacturing purposes,		813 60
Food for 18 oxen used in the mill,		163 00
Interest on $3,000 at 15 per cent. for wear and tear,		450 00
Rent of buildings,		120 00
Total,		$4130 00
Deduct for molasses sold for	$320	
125 tons pomace at $3 20	400	
Value of materials left,	30	750

Produce of 50,000 lbs. brown sugar at 6 7-10 cents		$3380 00
Sale of 36,000 lbs. 1st quality at $0 15	$8400	
Sale of 14,000 2nd quality at 0 10	1400	9800
Profit,		$3420 00

Should this notice be favorably received, I have at your disposal a few particulars respecting the cultivation of beets.

I am respectfully, sir,
your most obd't serv't,
MAX'N ISNARD,
French Vice Consul for Boston.

For the Farmers' Register.

THE CORN CROP THE GREATEST LANDKILLER.

Wardsfork, Charlotte Co.

The great waste of soil which appears in Virginia and other places, where corn and tobacco have been cultivated, has been universally charged to the latter. I am entirely willing that it should bear its just proportion of blame, for I have no partiality for the weed; but then "let the devil have his due." The Indian corn crop which has received comparatively but few of the curses of the friends of improvement, in my opinion has produced by far the greatest destruction of soil. For this opinion, I beg leave to offer the following reasons.

In the first place, the corn crop calls into action a much greater proportion of land. What a vast surface it takes in the present exhausted state of the country to sustain this crop! What myriads of acres are annually in action, and thousands of expensive teams are put in motion, for the same purpose! I will here observe, by the way, that I was glad to see a writer in the Register, who signs W., is teaching how to do with less of this land-destroying article. Tobacco is much more modest in its demands, and a smaller space being sufficient for it, of course its ravages on soil have not been as great.

Secondly—there is some little intrinsic difference in favor of the tobacco crop, and more in favor of the wheat crop than either. Land for corn is held longer in requisition than for tobacco, and of course gets more of the washing rains—and to do the corn crop justice, requires more ploughing, which subjects the soil to greater hazard. These repeated ploughings, which is the life of the corn, is the death of the land.

Thirdly—in the present wasted condition of our soil, it requires such a quantity of ground for a corn crop, that a number of chafed spots are embraced every year, which are most rapidly hastening into gulleys; for the poorer the spot, the easier it is killed. And the constant practice of bringing these galled places into cultivation, has exposed thousands of acres annually to the ravages of destructive rains and frost. It is this rubbing and scratching over those raw places, of our fields after worthless nubbings, that has given all that blood-chilling appearance of agricultural cruelty which has so marred the face of this once lovely State. Tobacco has slayed its thousands, but corn its tens of thousands. The practice of tending corn year after year, on the same field, without resting, with the most relentless rigor of cultivation, has given to the once pleasant face of the land the ghastly grin of exhaustion and disease; and this unfilial conduct of their sons, if persisted in, will bring down the gray hairs of the mother State with sorrow to the grave. Some attempts have been made to prevent the great annual loss of soil in cultivation, by hill-side ditches and horizontal ploughing; and it is true, that these have effected something in this way; but there come rains every year, which "make a joke" of these contrivances, and to the great mortification of the friends of improvement, the soil is seen taking its old course to the ocean, as obstinately as if obeying one of the fixed laws of nature, which, in fact, is the case. This levelling the broken surface of hilly fields by horizontal ploughing is in reality so contrary to nature, that I am not surprised to see her giving marked indications of her displeasure by sending those waterspouts now and then, which leave thousands of breaks and furrows in the beds through which the water has dashed, giving the hill-sides the appearance of having wept bitterly. I noticed last summer, after a lashing rain, one of those sad spectacles—a corn field in tears—(if I may be allowed the phrase) it being one of those remarkable instances in which Dame Nature is seen weeping over her own deeds of destruction—the hill-side ditches had given way on all sides the corn beds, those ropes of sand, had snapped in ten thousand places—galls and gulleys opened on all sides, and as for the poor soil, it was gone to its long home. I really felt the force of the injunction, "weep with those that weep," and mingled my best sympathies, both with nature and the good genius of improvement. My fancy became a little busy, while I looked over this scene of destruction, which soon presented to my mind's eye such a horrid picture of gulleys, galls, and broken trenches, that I began to think seriously of Red River. And truly, but for the efforts that are now making through agricultural papers and societies, I solemnly believe we should realize all that the most lively imagination can anticipate on this subject. But to return—I think it impossible, by any contrivance, to prevent our hilly lands, this side of the mountains, from washing, at least to that degree which will prevent their improvement much, if any. Make a dam across the bottom which conveys the water from a corn field well ploughed and trenched, and one will be amazed at the quantity of washing which will be caught in one season. I have set such land traps, not only for my own runaway soil, but also for my neighbor's—though having caught his, I never sent it back.

Well! What is to be done? Why, let us tend less corn, and more wheat and clover, and confine the cultivation of corn to the more level portions of our estates, and, according to W. make less serve; to raise grass, orchards, wheat and such things, on our more broken lands, that require but little ploughing, and expose the soil to but little hazard. This arrangement could be made conveniently on many plantations, more especially if we were to rely less upon a corn crop for the support of horses. If we go on tending our hilly lands in corn, I verily believe our latest agricultural history will tell the same melancholy tale that it does now—that this is a land of gulleys.

I. R.

For the Farmers' Register.

ON THE KNOWLEDGE, AND IGNORANCE, OF POLITICAL ECONOMY.

A plausible writer, in a miscellaneous essay in the last Register, remarks, that he should be pleased to see a sort of day of judgment arrive when all the arguments and all the theories which have been broached since the year 1789, to 1836, and especially those on the subject of the U. States' tariff, should be brought before the bar of public opinion. He also states, that the late Chas. Fox boasted his ignorance of political economy. I was not before aware of this. I have seen somewhere, that Mr. Fox admited he had never read Smith's *Wealth of Nations*—that the reasonings were too abstruse, and the calculations too minute for his comprehension. If Mr. Fox was ignorant of political economy, he was entirely unfit for the station of Prime Minister of England, to the attainment of which the energies of his life were directed—one which he held, for a short time in early life, and also in his last days. Perhaps political economy, in all its ramifications, was never perfectly understood by any man. It fluctuates in a degree with the times—depends much upon the existing state of a country, and its relative position to other nations. But there are some principles established by experience and sanctioned by time—and, that trade, when unfettered is generally most prosperous, is one. The late Mr. Huskisson, who, unlike Mr. Fox, valued himself a little for his knowledge of political economy, attributes to this cause the superiority which England had attained over the nations of the continent of Europe. Another maxim now received by statesmen is, monopolies, corporations, premiums and pensions, are generally mischievous to the body politic, and that corporations for profit ought never to be granted, except for some great public benefit, to which private wealth and individual efforts are inadequate. In Maryland, to our reproach, we find companies incorporated for spinning cotton, making gunpowder, duck and partridge shot, and digging alum; and when the value of marl becomes well understood, I should not be at all surprised if a company be incorporated for raising marl. Legislators, who pass such laws, may, with Mr. Fox, boast they have no knowledge of political economy.

The name of Charles Fox, in this country, has been generally associated with liberty, and that of his successful rival, William Pitt, with tyranny. Mr. Fox was a man of high talents, a great debater, and a patriot out of power. Had he have been Prime Minister of England, when citizens Robespierre, and Danton, and Marat, were giving practical lessons of liberty to the French, and sending the genius of universal emancipation into the kingdoms of Europe to disenthral the people and dethrone the monarchs, I have a suspicion, that Mr. Fox, instead of looking with the indifference he did upon their schemes, from the philosophic shades of St. Ann's Hill, would have been imbued with a little of the same spirit which Governor McDuffie now entertains for these philanthropic reformers, Tappan, Garrison, & Co. Sir Robert Walpole was a corrupt Minister, but a wise man; and he tells us, that nothing sharpens more the edge of patriotism than disappointment. If this great Court of Review should embrace politicians from the year 1789 to 1836, each in this land of liberty, where we were "all federalists, all republicans," now all whigs, all Jacksonians—all for the Republic, none for themselves perhaps a few illustrations of Sir Robert's maxim may be found.

I have always deemed the protective tariff a germ of Bonaparte's continental system. At the conclusion of the late war, having foiled Great Britain, in arms, we had good dispositions to check her commercial influence, and by the joint efforts of some hot spirits of the south, some cool spirits of the north, and some calculating spirits of the west, the protective tariff was concocted. It is now in a quiet slumber—sleeping away its life—yearly diminishing in vitality, and will finally expire in 1842. I greatly prefer its "day of judgment" be postponed till after death. Bringing it before the bar, before that period, might break the enchantment, and re-kindle the fierce fires which had nearly scorched some of our southern brethren.

—— ——.

Eastern Shore, Md., March 20th, 1836.

GYPSUM DISCOVERED IN QUANTITY IN PRINCE EDWARD COUNTY.

To the Editor of the Farmers' Register.

Prince Edward,
April 7th, 1836.

Since the attention of the Legislature and the public generally seems to be directed to the laudable object of developing the resources of Virginia, I shall be gratified, if you have not more important matter for publication, that you will give insertion to the following facts.

It is probably known to you that parts of the county of Prince Edward have been supposed, from some cause, to contain that precious metal, gold; and to ascertain the truth of this supposition, pits have been sunk in various parts of it, but particularly in the upper or western end. It is matter of history, that the alchymists, in their wild schemes of discovering the elixir of health, and philosophers' stone, found out many facts of the utmost importance to the science of chemistry: and thus it has happened with the miners; for although they have been unsuccessful as it regards the object of their search, yet they have supplied a hint, which, improved upon, has terminated in a most fortunate result.

My plantation, which lies in the vicinity of Walker's Church, was one of those sites which were thought to give promise of gold; and accordingly it was dug upon, though not by myself, for I happen to be one of those who think that more of this precious metal is to be obtained within a foot of the surface, than at any greater depth. However, though no gold-digger by profession, still I was prompted by curiosity to visit the pits frequently, and observe operations. The matter that was excavated, afforded then but little interest to me; and after spending a sufficiency of labor, time and money, and after fairly testing the best specimens of auriferous ore, the project of gold-digging was abandoned.

Previous to this, I had never used any gypsum, and if I had ever seen any, had not noticed it particularly. About a year after gold-mining had ceased on my farm, I began the cultivation of clover, and having learned the efficacy of gypsum as a manure in accelerating the growth of this plant, I determined to make an experiment, and found it succeed far beyond my most sanguine expectations.

From the striking resemblance of certain stones thrown out by the miners to the rock gypsum, I obtained from market, I was induced to make trial of the former on my clover fields in such a manner as to institute a fair comparison of its effects with the true gypsum, which I was the more willing to do as I had not procured enough of the latter to plaster my whole crop. It is highly gratifying, sir, for me to inform you of the results of my experiments. I had anticipated an entire failure—judge then of my satisfaction, when I found my success complete.

The three field on which I experimented, I divided as follows:

Field No. 1 was laid out into two equal portions longitudinally, and plastered one half with the imported, and the other half with the material found on my own plantation. The clover plastered with the latter was but slightly inferior to that manured by the former.

Field No. 2 I divided into three equal parts, and sowed each of those thirds lying at the sides of the field with the imported plaster, and the third lying centrally I sowed with that found on my farm. The difference in the crop was scarcely perceptible.

Field No. 3 I separated into nine equal sections, running transversely the whole breadth of the field; and in order to arrive at a more determinate conclusion, I sowed the first of these with my own plaster, selected from the best lumps, the second with the imported, and the third was left unsown. I went over the whole field in this way, beginning with the domestic, succeeded by the imported, and leaving every third section unplastered. The result was perfectly satisfactory. The clover manured with the domestic plaster was among the finest I have ever seen—that with the imported not as good, and that left unmanured scarcely worth the cutting.

I am thus particular, sir, in order to show you the evidence on which I rest my belief of the benefit; and to convince you that this is not a matter of speculation, but one that has been submitted to rigid experiment. Those who are well acquainted with the aspect of the plaster, would probably have been able to pronounce upon its character by a bare inspection, but when united to its appearance, we have proofs of its fertilizing effects, we can have no just grounds of doubt.

After being personally convinced of the utility of this substance found near my residence, I determined to make diligent search for it, and ascertain, if possible, whether it might not be found in quantities sufficient to supply that portion of the county in which I live; and after sinking pits at various localities, I at length struck upon a points where the mineral appeared to be very abundant; and, after patiently digging to a considerable depth, and making excavations at several adjacent points. I have concluded, if all that is gypsum which I suppose, that the supply is inexhaustible. To make assurance doubly sure, I sent parcels of the substance to the Professor of Chymistry at Hampden Sydney College, with a request that he would analyze it and notify me of the result. He returned for answer, that he had never examined purer specimens of the sulphate of lime; that he was happy in the anticipation of the benefits that would arise from this discovery; and finally exhorted me to make it known through the medium of some public journal.

The high price of the gypsum, and the difficulty of transporting it, render it an object of the utmost importance that farmers should be enabled to procure it at some convenient distance, and at such a moderate charge as to made it a profitable manure. Many of those persons whose lands most require the application of this enriching agent, have not the means to purchase and transport it to their farms; and those whose circumstances are better, and who have made use of it, find that the expenseof obtaining it, swallows up most of the profits arising from its employment. Here then is a great difficulty to be obviated in the use of the foreign gypsum, and certainly nothing will tend more to this end than the discovery of quarries on our own soil, from which persons may at any time obtain whatever quantities they please, and almost on their own terms.

Indulge me, sir, in conclusion, in making a few observations on the renovating influences of this and other manures now being found in different parts of the State. The time was, when it was believed that the waste lands of Virginia could never be serviceable to the agriculturist; and the patriot had the heart-sickening spectacle every where presented to him of the progressive destruction of the land of his birth without any hope of its ever being reclaimed. But, sir, since the establishment of your publication, Virginians have been encouraged to look around them and see what might be done: and what has been the consequence? We now confidently anticipate the day when old Virginia, like old England, will be as it were a garden; when her fields shall be crowned with golden harvests; when her lawns shall vie in verdure with the rich vales of the west; when her pastures shall be teeming with cattle—her surface intersected with rail roads and canals—and when her population shall be dense busy and prosperous. And what is to cause this magic change? Doubtless gypsum, and the various species of marls, are to be the chief agents. Much of the present fertility of several counties in the State is attributable to the former, whilst others in a different region are as much indebted to the latter. The day is fast approaching when every part of Virginia will have some convenient manure adapted to the soil—when the Old Dominion shall take her harp from the willows and in cheerful strains celebrate her release from the captivity of sterility, and resume that proud and dignified station among the States of the Union, which is due to the mother of the greatest and best.

Yours, very respectfully,

JOHN FRANCIS.

RAIL ROADS IN NORTH CAROLINA.

To the Editor of the Farmers' Register.

Sir: Having for immediate purposes made a partial reply to P. Q., I now take up the subject in its graver and more important aspect. It is now fully seventeen years since I imbibed the idea of the possibility of making the Chesapeake the great mart of American commerce, and Norfolk the great gate through which it must pass. Hence, I must be pardoned, if having this object in view, I have overlooked local interests, local prejudices, and local partialities.

P. Q. charges me with being "regardless of the feelings of those who have *long* and *zealously* labored to promote a *favorite* scheme"—with having, by one *fatal* stroke of my pencil dashed their cherished hopes and raised a rival to crush "this favorite scheme." As to the length of time and zeal of promotion exhibited in these worthy gentlemen, I cannot but confess my ignorance; and apprehend, if the columns of the Richmond Enquirer, and the Petersburg Intelligencer, and Roanoke Advocate, soliciting attention to this subject, and those of the Raleigh papers pronouncing any thing but a Rail Road to Newbern as illusory in its character, and destructive to the interests of N. Carolina, are consulted—if, I repeat it, these journals are consulted, I apprehend that it will prove that for "long" we may read "short," and for "zealously" we shall read "apathetic." As to the "deep damnation" I have dealt to a favorite object, and the *fatal* stroke of my pencil, which, like the thunderbolt of a *Jupiter tonans et fulminans*, was to dash all their cherished hopes, I am happy to see not only that nothing like it has occurred, but to learn the attempt made to complete the subscription on the 15th March, 1836, has, according to a paragraph in the Raleigh Register, nearly, if not quite, succeeded—a circumstance, upon which I do most heartily congratulate them *and* myself, as I still ardently hope such a direction may yet be given to this capital and these exertions, as shall make a road, which will be both productive of profit to them, as contributors, and of honor to them as the citizens of a great, wealthy, important, and intelligent community. I trust, I repeat, it will yet be instrumental to a Road pervading the State from the banks of the Pee Dee to the Roanoke.

If I may use the expression, there is a noble conspiracy forming for conveying the trade of the west to New York and Philadelphia. A careful examination of the subject induces me to believe that Louisville and Baltimore will be connected. Lieut. Dutton, (Doc. 1, session 1835-6, p. 185,) says, the Ohio can be rendered navigable at all seasons with certainty, only "*by a series of locks and dams.*" The New York, papers boast that they will make the Alleghany, and Pittsburg, as much a New York as a Pennsylvania river and city—a circumstance which is practicable, as if the Ohio can thus be improved to the extreme of the Alleghany, there is no question the navigation of both will be made subservient to the views of the "Empire State." But still the improvement of the Ohio to a given point, say Catletsburg, will, if the "Dominion" does but make due exertions, bring an immense trade to every harbour in the Chesapeake, especially if by the adoption of the light draught steamers, and the lock and dam system, other rivers can be rendered navigable, during wet *and* dry seasons, and seasons not interrupted by frost, as are those of the north. As to the steamer, one has just reached Savannah of 27 inches draught, from Liverpool—a circumstance, that, it is to be hoped, will either lead to the remission or reduction of the duty on them, or to a discovery that they can be built at Pittsburg or elsewhere in the U. States.

A report of the trade of Louisville from the Board of Internal Improvement, in Kentucky, states the total tonnage of the port at 306,400, and that 1256 steamers pass the canal in the year. A Wheeling paper, speaking of the trade between Louisville and Pittsburg, states that there are sixty steamers, of course of a light draught, annually employed. It forms its estimate for only from 6 to 8 months, and makes out that 433200 tons of merchandise are transported annually in steamboats, on the Ohio, between Pittsburg and Louisville—amounting in value to more than $16,000,000—so that on a river rendered permanently navigable by the lock and dam system, and navigated by small steamers, as pronounced to be practicable by Lieut. Dutton, it is probable the amount will be doubled, or made $32,000,000.

Such are a few of the circumstances around us. I think they demonstrate not only the necessity, but the ability of the South to create a market in the Chesapeake for the benefit of that section. How is the end to be effected? The trade of the west must be brought by rail road and canal to the Atlantic at Savannah, Beaufort and Charleston, S. C., Wilmington, N. C., and Norfolk. Savannah must ship the cotton of the west, yielding part of her trade to Charleston, that city in its turn, giving a portion of hers to N. Carolina; and all combining to make the Chesapeake emphatically the great emporium of the South. "Thus," to use the words of the report from Yorkville, S. C., "would the South be connected by a tie of no ordinary character with Virginia, and thus would the great bond of southern union, so eminently desirable, so imperiously necessary in the present momentous crisis, be at once more generally and completely secured. Already united with Georgia, by the strong and enduring sympathies of commercial interests—our destinies indissolubly bound up with those of N. Carolina—towards Virginia, the relation of a neighbor, added to that of long-tried friendship—and to crown all, the great west made our fire-side associates and commercial friends—with such an union, with such elements of common fidelity, what combination of interest, of envy or of passion, by whatever diabolical spirit its fell purposes may be inspired, can prevail against us?"

To produce such a state of things, and give to Baltimore, and to every port in the Chesapeake, the whole of the middle west, the Chesapeake and Ohio Canal, the Baltimore and Ohio Rail Road, the James River improvement, and indeed every interest in their vicinity, are concerned.

What then should be the course of a North Carolina Road? Should it be such as to divide, instead of concentering the interest of the State? What is the language of the Yorkville report as to the upper route? That admirable paper "suggests, that the future participation of Virginia is not to be neglected, and incidentally to *her* participation in the ultimate accomplishment of a *great chain of railways, leading through the northern and middle States.* As an evidence that this is no visionary anticipation, it may be mentioned, that a Rail Road is now in process of construction, between Richmond and Petersburg, Va., and Weldon, N. C.; and at the last session of the Legislatures of these States, a similar incorporation was granted, to connect Weldon with Evansham in Virginia, from which road, at some point, not precisely known to your committee, *it is now in* contemplation to construct a rail road to pass near Greensborough, N. C., through Lexington to Salisbury, N. C., at which point, but about 50 miles of railway would connect Salisbury with the great commercial highway, *should either of the routes here recommended be found practicable.*"

These routes are "east of the Broad, through Richland, Fairfield, Chester, and York, penetrating N. C., so as to intersect the counties of Lincoln, Rutherford, Burke, and perhaps Buncombe, and having for its immediate vicinity nearly all the wealthy section of the south-west of N. Carolina;" *or* "to follow the Valley of the Broad and Catawba." In North Carolina, the outlet recommended *appears* to be nearly that, for Col. Long's reconnoisance of which, Mr. White of Kentucky, has moved in Congress—Linville Mountain to the sources of the Licking, or Big Sandy. The report continues, "Thus by one continued chain of rail roads, would Charleston and Cincinnati (Louisville and Lexington) be connected with Richmond and Petersburg. * * * * In such a state of things, it is easy to perceive that nearly *all the travelling* of business, and certainly all that of pleasure, between the north and the south, *will be diverted*, from the sea board, *into the new, more rapid, and more convenient channel we have attempted to describe.*" And, if the low counties of the Carolinas, and Georgia, do not exert themselves, such will, such must be the case.

But, to exhibit the inducements, I must continue my quotation from this enlightened report. Many of these routes are through the finest mineral countries in the world. In York, Union, and Spartanburg, are to be found iron, marble, granite, lime, the latter of which could be sold at Columbia, of course at Fayetteville, &c., &c., to great advantage. Next are noticed, the iron foundries of Lincoln, and the salt works of Virginia. As to the Yadkin, if the lock and dam system will succeed, all the country it waters, as well as Wilmington and Fayetteville, may be much benefited.

P. Q. is vehement as to the Wilmington and Halifax Road. "It will not receive enough to keep it in repair." Does he recollect the efforts of Philadelphia? Is he aware of the projected road to Pokomoke, on the Eastern Shore, the object of which is, to dispense with the steamer up the bay, and to lessen its passage from Norfolk? He may rest assured, that a road from Darlington and Harleesville, S. C., to Fayetteville, to Halifax *via* Waynesborough, Tarborough, &c. &c., would make travellers forget that Raleigh was in existence. He should refer to Col. Long's report (Doc. 177, session 1834–5.) He will there find this route distinctly recognized. It is one which I hope will be recognized by Congress, in a discussion that must be in progress before the recess.

I would here, at the risk of being desultory, express my hope that some member of Congress will take up the question of the iron steam boat. The following paragraph speaks volumes on the subject, especially illustrated as they are, by the arrival of one at Savannah; and by the fact, that a bill for the remission of duties on a steam boat, passed the Senate of the U. S., the 17th Feb., 1836. This boat must be the one which has reached Savannah by the Alcyone from Liverpool. The one alluded to in the annexed paragraph having been built in London at the publication of the notice:

"There is at present building an iron steam boat 120 feet long and 26 feet wide, at Mr. Laid's yard, on the other side of the river. The vessel is to be taken to pieces and sent across the Atlantic to Savannah, between which place and Augusta, she is intended to ply with cotton, &c.—She is so constructed as only to draw two feet and a half of water, and yet to carry 600 bales of cotton on her deck, which, when the wood work is added, will be upwards of forty feet wide. Her burden is 375 tons, carpenter's measure. We believe that she is the largest steam boat ever built in this porte: she is certainly one of the most curious and ingenious.

"A wrought iron steam boat has been completed in London for the East India Company, to be employed in the navigation of the Ganges. It is 125 feet in length, entirely of iron, except the deck, carries an engine of 60 horse power, and draws less than two feet of water."

In addition, we are indebted for the following to the National Intelligencer: "The wrought iron steam boat, ordered from England, has arrived (in pieces) at Savannah. Her length is 120 feet, her beam 26 feet, and her depth (of hold) 7½ feet. She is estimated to draw, *with all her machinery, and every thing aboard*, 2 feet 3 inches, and will have an English low pressure engine of 46 horse power."

I cannot avoid making some observations on the heterodox notions of P. Q., as to the power with which *he* would invest legislatures in the management of rail roads, or indeed any public improvement. I want but to learn the result of the inspection laws in New York and Virginia, and the sagacity of N. Carolina, in refusing twelve years since, $10 or 20,000 to Hamilton Fulton for an experimental rail road to Swift Creek, to pronounce that in legislatures, the "collected wisdom" of the nation is not to be found, and therefore, they ought [not] to be entrusted with the powers "of protecting roads from competition."

P. Q. forgets that in an industrious and enterprising country, roads ought to be a matter of expense. The manufacturer at Petersburg, whose stock is at 25 per cent premium, might as well grumble at being obliged to furnish new machinery to render the profit producing this premium permanent, as the citizens of a country complain of the expense of rail roads; and forgetting that they *indirectly* add infinitely more to the wealth of the community than any charge they create in repair, call for the odious monoply advocated by P. Q. If he wants for proof, of what a monoply will do, or rather thank the Supreme Court of the U. S., an *imaginary* monopoly, I will furnish him with one. The Charleston and Hamburg company are now avoiding a wealthy country, and one well calculated for a Rail Road, and running their road in a section totally opposite in character and result. This can only be done to ensure a still greater extent to their monopoly.

Indeed, joint stock companies, as concocted in the U. S., are fast becoming nuisances. Coke, in his Reports, alludes to a book published in 1610, being a "declaration of His Majesty's pleasure," &c., p. 13, "that monopolies are against the laws of the realm; and, therefore, expressly commands that no suiter *presume* to move him to grant

them." His Majesty, King Numbers, has a power superior to this. * * * * *
* * * * * * * G. L. C.

From the Raleigh Register.

THE MOUNTAINS OF CAROLINA.

The younger Michaux, on his way from the valley of the Mississippi, in the fall of 1802, passed through the counties of Yancy and Burke; and in the small volume, containing an account of his travels, that was published soon after his return to Paris, the opinion is expressed, that in these counties, the Alleghany Mountains attain their greatest elevation. He mentions, in evidence that this belief is well founded, that his father found trees and plants growing upon them, which he did not meet with again before reaching Canada.

The geology of these counties has some peculiar features. They were visited during the last summer, for the purpose of tracing the boundaries of their rock formations, and along with other collateral objects, provisions was made for measuring the heights of their principal mountains, with their bearings and distances from each other. Some gentlemen in the west, who expressed an interest in the subject, were promised an account of the results; and they are communicated with some explanatory remarks, to the Register, in the belief that they will not be without interest for persons living in other parts of the state.

It is well known that the mercury in the tube of the barometer is continually oscillating, especially in the high latitudes; so that we cannot, from a single observation of its height, infer the elevation of any place above the level of the sea. But Daville found from a comparison of the Meteorological Registers kept with great care for a series of years in different parts of Europe, that the changes are simultaneous and similar in places considerably remote from each other.

One barometer was therefore stationed at Morganton, and a record kept of its movements by Mr. Pearson of that place. This served as a standard. The observations made at the same time (nearly,) upon the tops of the mountains and at Morganton, furnished the data for calculating their elevations above that village, and the mean of ten observations, on successive days, gave what is probably a near approximation to the height of Morganton above the level of the sea—968 feet. Deducting from this the descent to the bed of the Catawba, there remains only about 800 feet of fall between the ford leading over Linville and the sea. This will not be regarded as an extravagant estimate by those who are acquainted with this stream, and by such as have had no experience in investigations of this kind it will be condemned as falling far below the truth.

North of the point where the James River leaves the mountains, the first high ridge of the Alleghanies is called the Blue Ridge. In North Carolina, this name is applied to the range that separates the eastern and western waters. This is commonly the first high mountain, but not always. The Table Mountain, which forms so fine and striking a feature in the scenery about Morganton, is not a part of the Blue Ridge, but a spur or outlier. It seems, when seen from Morganton, to be a round tower rising perpendicularly from the summit of the first range of the Alleghanies. It is, in fact, a narrow ridge, affording a very fine prospect of the fertile valley of the Catawba, and its tributaries on the south-east and east, and of nature in her wildest dress, where the Linville pours over the rocks along a deep ravine, wholly untenanted and uncultivated, and of a vast extent of mountain peaks and ranges on the north east. Its top is 2,453 feet above Morganton, and a little more than 15 miles distant in a right line.

The Grandfather, 17 miles from the Table, and 28 from Morganton, has hitherto been generally supposed the highest mountain in North Carolina. But it is found that, being difficult of access and enveloping himself in mystery, it has happened to him, as it does not infrequently to men, placed in corresponding circumstances, that he has enjoyed a reputation to which he is by no means entitled. The best point of departure for ascending the Grandfather is the Globe Settlement, near the head of John's River, where the traveller will find a pleasant home in a beautiful valley, and at James Riddle's 1,600 feet above, on the side of the mountain, a faithful and intelligent guide. From the distance and the roughness of the way, it will prove, as my friends and quandum pupils, Messrs. Clingman and Rose Borough can testify, a severe day's labor to a person inexperienced in travelling on foot, to visit the top and return. The summit is 4,588 feet above Morganton.

We may notice here an error in the act of the legislature establishing Yancy County, and assigning its boundaries. It is said, that they shall run with the Tennessee "line to the county of Ashe: thence with the line of said company to the Grandmother Mountain," &c. It is here supposed that the Grandmother is either the same mountain with the Grandfather, or a continuation of it, and in the Ashe line, whereas she is 3 or 4 miles distant from both. She sits humbly and submissively at the feet of her venerable spouse, with the little Grandson between—a pattern to all good dames in the country below. From the fact that her head is crowned with the balsam fir (no very certain sign) she may probably have an elevation of 2,600 feet. If there should seem to be any thing to warrant a suspicion of a want of affection in this worthy couple, in the distance to which they have located themselves from each other, their great bulk should not, whilst we are forming our judgment, be neglected.

The Roan Mountain is 15 miles from the Grandfather, and 35 N. W. from Morganton, lying directly over or beyond, the Hawksbill. It touches the Tennessee line, but the highest peaks are in North Carolina. This is the easiest of access, the most beautiful, and will best repay the labor of ascending it, of all our high mountains. By one of my friends, the preference is given to the Yellow, which is in fact a continuation of the Roan, on account of the symmetry of its form; but it is considerably lower. With the exception of a body of rocks looking like the ruins of an old castle, near its south western extremity, the top of the Roan may be described as a vast meadow, without a tree to obstruct the prospect; where a person may mount his horse and gallop for a mile or two, with Carolina at his feet on one side, and Tennessee on the other, and a green ocean of Mountains raised into tremendous billows immediately about him. It is the Elysium of a southern botanist, as a number of plants are found growing in this cold and humid atmosphere, which are not seen again till we have gone some hundreds of miles farther north. It is the pasture ground for the young horses of the whole country about it, during the summer. We found strawberries here in the greatest abundance and of the finest quality, in regard to both size and flavor, on the 30th of July. The elevation of this mountain was twice taken, on the 22d and 30th July—with a difference of 28 feet in the results—5,042 and 5,070 above Morganton. Of these measurements, the latter was made with the greatest care and in the most favorable weather. The height assigned to the other mountains was also rudely verified from this, by means of a water level.

The Black Mountain, lying mostly in Yancy, but forming through a part of its course the boundary between Yancy and Buncombe, is a long ridge at a medium distance of about 30 miles from Morganton. It has some peaks of a greater elevation than any point that has hitherto been measured in North America, east of the Rocky Mountains, and is believed to be the highest mountain in the United States. It is a matter of considerable difficulty, in the case of a long ridge like this, that swells here and there into a knob two or three hundred feet higher than its neighbors, from our inability to determine how much of the apparent elevation of one, amongst a number, is due to its nearness, and how much to height. The Black Mountain cost nearly a week's labor in fixing upon the peak to be measured and the measurement. We ascended first the summit nearest the road leading from Morganton to Burnsville, and found it 92 feet lower than the Roan, with peaks considerably more elevated farther south. Yeates's Knob, between the waters of Caney River and Ivey, was next represented as over-topping every thing in that part of the country. Though higher than the Grandfather, it proved to be considerably lower than the Roan, but from its summit we had a fine view of the Black Mountain Ridge sweeping round in a sort of circle, at the distance of 8 or 10 miles, and were able to distinguish the highest Knobs. Two were very nearly equal, but the one at the head of the ridge between the north and middle forks of Caney River, was finally fixed upon as the highest. On its top the Barometer stood at 23.807 inches; and it has an elevation of 5,508 feet above Morganton, or 6,476 above the level of the sea.

The mean elevation of Yancy county above Burke, is about 1,600 feet; so that it is about 2,500 above the level of the sea. The ford of Toe River, near Thomas Young's is 1,308, and Burnsville 1,632 above Morganton. The ascent of the Blue Ridge from Turkey Cove Creek to the Gap, is 1,665 feet.

For the sake of comparison the following heights are given. The first five are copied from Worcester's Gazetteer:

Mount Washington, in New Hampshire, hitherto accounted the highest Mountain in the United States—highest peak	6.234
Mansfield Mountain—Vermont,	4.279
Saddle Mountain—Massachusetts,	4.000
Round Top—highest of the Catskills,	3.804
Peaks of Otter—Virginia,	3.955
Table Mountain—Burke, N. Carolina,	3.421
Grandfather,	5.556
Yeates's Knob,	5.895
Black, at Thomas Young's,	5.946
Roan,	6.038
Highest Peak of the Black,	6.476

There are other high mountains at no great distance from those that were measured, as the Bald Mountain in the western part of Yancy and the White Top in Virginia, which are nearly, if not quite, as high as the Roan. In the south eastern part of Haywood county, near the South Carolina line, there is a tremendous pile, and between the counties of Haywood and Macon and the state of Tennessee, the Unikee Mountain swells to a great elevation. But these appear to the eye to be lower than the Black.

As the Western Mountains, now that their respectability in regard to height and interest is ascertained, are likely to attract an occasional visitor from below the ridge, and perhaps from the neighborhood of the coast, a few directions answering the purpose of a "Guide to the Mountains," are added.

The Pilot "has not infrequently been the *Ultima Thule*, or rather the *Columna Herculis*, by which the excursions of such as have travelled heretofore in search of mountain scenery have been limited. It is a remarkable mountain, but after having been for a time amongst the giants of the west, one cannot help feeling some contempt for the Pilot as he passes it on his return. Its height is just about that of the low gaps in the Blue Ridge.

By such as would see more of the mountains, the first point to be reached is Morganton. From this place the Table Mountain is frequently visited; is easy of access, and will hardly be neglected by any one who is in search of beautiful and romantic views and prospects. The Falls of Linville, are not far distant from the table, and though not at present a place to be visited by the softer, will repay one of the hardier sex, for the fatigue of finding his way by a rough road over the ridges, to Linville Cove—of clambering the yet rougher hills that still intervene between him and the object of his travels, and of wading the river two or three hundred yards for the purpose of reaching the finest point of view. It is perhaps the wildest and most picturesque scene in North Carolina, with a splendid description of which, if we had room, leisure, and the inclination, we might embellish this communication to the Register. But he is a churl that will insist upon plucking all the flowers that adorn his path, and not leave a pink or rose for those who are to come after him. Passing by the Old Fields of Toe, and the Forge, where iron little inferior to the best, if it be not absolutely the best made in the United States, is manufactured, he may reach the summit of the Roan by this route, over the top of the Yellow. His fare and accommodation will not however be of the best, and although the poet declares that

> A summer night in green-wood spent,
> Were but to-morrow's merriment,

we think a good house and comfortable bed very much to be preferred.

The other route is by the way of the Pleasant Gardens and Turkey Cove, or (if the Burke County Court will have the road above McKinney's put in repair) over Linville Mountain to Cane Creek, where we will find himself in the Baker Settlement, amongst a kind and worthy people. From this place, if there be ladies in the company, they may ride without danger of much fatigue, quite to the top of the Roan—a distance of 4 or 5 miles.

It is most desirable to have a clear day for the excursion, and it is worth waiting for, if our visit happen to be made at a time when the mountains are wrapped in clouds. Such a condition of things is by no means improbable. The rain falling annually about the head of Toe River may be estimated at double of that descending upon the same area below the ridge and at some distance from it. It was part of our scheme to collect materials for giving greater precision and accuracy to the map of this part of the state, nor was it through a want of zeal or faithful labor (it requires very little of either knowledge or skill) that we failed; but during the whole term of our stay about the mountains, there were but two days that they had not clouds resting upon them, a large part of the time.

But even under such circumstances, there is no want of objects of attention. Often, especially in the morning, the mountains lift their head into a serene sky above a sea of mist and cloud that girdles their sides. They may be ascended then, if for on other object, for the sake of the prospect which awakened the slumbering fire in the bosom of Beattie, and inspired one of the finest passages in the Minstrel:—

"And oft the craggy cliff he loved to climb
When all in mist the world below was lost,
What dreadful pleasure! there to stand sublime,
Like shipwreck'd mariner on desert coast,
And view th' enormous waste of vapor, tost
In billows lengthening to the horizon round,
Now scoop'd in gulfs, with mountains now emboss'd,
And hear the voice of mirth and song rebound;
Flocks, herds, and water-falls along the hoar profound."

Or without going above the clouds, he may find in the streams below, an humbler but not less agreeable amusement, in the capture of the speckled trout with which they abound. It is a luxury to feel him bite: he takes hold with such earnestness, zeal and hearty good-will, and this luxury is exchanged for another not less alluring, when after having been prepared by the cunning hand of a comely 'hieland' maiden the biter is bitten in his turn. [See Doughty's Cabinet of Nat. Hist. vol. I. p. 145—9] Or, instead of the trout, he may catch the amiable quadruped with the many names that are associated with him (called in Yancy the Crocodile or Water Puppy) who is not found except in the tributaries of Ohio, and, we believe, is confined to the clear cool streams that flow down the western declivities of the Alleghanies—cook him and show the Yancy people that the dislike generally entertained for him is prejudice, and that he is in fact excellent eating.

The roughness of the sides and top of the Black Mountain is likely to prevent it being often ascended from motives of curiosity and pleasure. A route, very much better than that pursued by us, is not likely to be discovered, and that can be accomplished only on foot; and for between one and two miles, it is through thick laurels and along a bear trail. What these are, must be learned by experience, as description alone will not convey an accurate idea of them to the mind of a lowlander. The laurels are so closely set, and their strong branches so interwoven, that a path cannot be forced by pushing them aside; and the hunters have no method of advancing, when they happen to fall in with the worst of them, but that of crawling along their tops. The Bear, in passing up and down the mountain, finds it wisest to keep the ridges, and trampling down the young laurels as they spring up, breaking the limbs from the old ones and pushing them aside he forms at last a sort of burrow above ground, through this bed of vegetation, along which he passes without difficulty. This is a bear trail; which though an excellent kind of turnpike probably in the view of the animal that formed it, is much less highly approved by the two-legged animal who tries it after him, and who submits with some degree of shame and indignation to the fashion of the place, in regard to the attitude he assumes as he travels up and down the mountains. From such an expedition, he is likely to return thoroughly fatigued at night. The top is covered with the balsam fir, from the dark and sombre shade of whose foliage it doubtless received the name of the Black Mountain. The growth of the tree is such on these high summits, that it is easy to climb to the top and taking hold of the highest branch look abroad upon the prospect. At the time of our visit, the mountain was enveloped in mist, which prevented our seeing more than a couple of hundred yards, and we were so uncomfortable from cold, that some of the company urged a return with the least possible delay, and this when it was clear weather, at a small distance below the ridge and the Thermometer at 80.

The temperature of a few wells and springs is subjoined. The finest iced water is a vapid drink, in comparison with the pure element that gushes from the sides of these Western Mountains.

Wells on	Chapel-Hill, Oct. 17.	59
Wells in	Lincolnton, July 6,	61
	Morganton, July 16.	58
Spring	Keller's Field,	50
"	Daniel Moore's Globe Settlements,	57
"	James Riddle's,	54
"	Near the top of the Grandfather,	53
"	Ascent of the Roan,	52
"	North side of the Black Mountain,	50
"	Another, same mountain,	48

N.

MANURING WITH LEAVES AND MUD COMPOST.

To the Editor of the Farmers' Register.

Craven county, N. C.
April 10th, 1836.

There is a gentleman residing in an adjoining county who inherited a patrimonial estate consisting of a worn-out farm, and some few accessories to its cultivation. He married and went to work on it, but it took but few crops to show him that the product would not support his increasing family. Many a sleepless night did he pass in pondering over his circumstances. After much deliberation, however, he resolved, like many others in the same situation, on emigration, and visited the south to make arrangements for that purpose.

He travelled to some extent, but returned perfectly disappointed with the country. He went "hard at it" again for another year, and saw nothing but bankruptcy staring him in the face. Every year found his debts accumulating. He had been raised to agricultural pursuits, and to agricultural pursuits alone. After a great deal of perplexity however, in resolving and re-resolving, he finally concluded to try and improve his soil in some way or other: but how should he do it, was to him an important question. It being then a thoroughly new thing in that part of the country, he hardly knew in what way to begin. The practice then was (and is too much so now) to get all you can from the soil, and return nothing to it. After much reflection on the subject, he commenced hauling pine leaves and other litter into his cow and horse lots, and as soon as that was tolerably trampled, he gave it a good coat of mud from an adjoining branch, and continued alternate layers of litter and mud, till it got a foot or so thick. He then piled it up in large heaps, to let it undergo a fermentation. In the spring, he hauled it out and manured his corn, some in the hill, and some broadcast. His succeeding crop bid him strenuously to proceed. As soon as he had laid by his corn, he went at it again with increased diligence. His anticipations of futurity, which were before so painful, were now loaded with pleasure. He saw a way of driving that grim monster, poverty, from his path.

The individual who is the subject of this article, has continued to proceed in this way for the last twelve or fifteen years, and he is now in prosperous circumstances. His crops amply repay his labors. His neighbors who at first laughed at him for throwing away his time, are now following in his footsteps, and there is a prospect of the whole neighborhood's being greatly improved, by the previous necessities of this one individual.

W.

EXPLANATION AND CORRECTION.

To the Editor of the Farmers' Register.

Cambridge, E. S., Md.
March 31, 1836.

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In your March No. I discovered that you had done me the honor to insert the two letters I had written you respecting the 2d edition of your "Essay on Calcareous Manures," which you had politely presented to me—and I regretted to discover in the last paragraph of the second letter, a typographical error which gives an unfriendly aspect to the spirit and intention of the communications, and very different, I assure you, from the motive which dictated them. I designed, in that paragraph, to apologize, for the *freedom*, or, as I termed it, "the frankness" of my remarks, and your printer has rendered it "harshness." Now, though I am not sensible of any harsh sentiment in the letters, yet it would be inferred, from the printing, that I had designed and believed there was, which is remote, in truth from the fact. In the same paragraph, "except" is put in place of "accept"—which, by the by, is too obvious an error to be regarded. In reference to your comment on my exception to your nomenclature, (as to the term "calcareous earth"—) I must confess that I had not observed or referred to your note, (in the Appendix) containing the explanation of your difficulty in the selection of a term, which would best suit your purpose. I had sufficiently gratified myself with the more essential matters discussed in the Essay.

JOSEPH E. MUSE.

[The last fault named above, was of course the printer's, as the meaning, and, therefore, the proper word, was obvious: but the substitution of "harshness" for "frankness" was owing to the difficulty of reading the word, and the context, in that case, did not serve (as in general) to determine the intention of an illegible word. But in either case, we repeat the assurance formerly given to our respected correspondent, that no apology was necessary for his strictures—nor would have been necessary, even if they had gone to such extent as to deserve the word "harshness;" and it is only because, he deems this explanation to our readers to be necessary, and to comply with his request on that account, that this extract is here inserted—and not because we think that any thing like apology was required for the remarks of our correspondent, either as they were in fact designed, or as mis-read and therefore mis-printed.]

ON FIRING TOBACCO THROUGH FLUES. THE BENEFIT OF CUTTING WHEN FULLY RIPE.

To the Editor of the Farmers' Register.

Goochland, April 16, 1836.

Believing a portion of our time cannot be more profitably employed than in the acquisition and dissemination of truth, permit me through the medium of your very valuable and interesting paper, to offer to the public, a few suggestions in support of a mode of curing tobacco (viz: by flues,) which I deem superior to any other with which I am acquainted. I do this the more cheerfuly, as it will have a tendency to divert my mind from subjects of minor importance, and from the conviction that it will not prove unacceptable to those of your readers whose interests it may be to secure their crops (when housed,) from the destroying flames. Perhaps it may occupy an improper position in my mind in believing this plan to be something new; if not, its age will only bestow on it additional credit; and I hope my imperfect description of the construction and effects, may have a tendency to elicit from some of your able and ready writers a more correct account of construction and utility, as developed by their successful experiments.

I will now proceed to describe the formation of the flues, and then say a few words on the advantages they possess, (over the common way of curing,) as related by Mr. Thomas B. Gay, from whom they originated. The fire-place should be made about twelve feet from the outside of the house: six feet long three deep, and eighteen inches wide. The flue from the fire-place through the house should be eighteen inches deep, and twelve wide at the bottom, drawn in at top, so that one brick will cover it. The fire-place and the part of the flue outside the house, should be arched with brick, (mortar would be equally good, perhaps preferable,) and covered over with dirt about a foot thick, to prevent the escaping of the heated air, and injury from weather. There should be two fire-places to a twenty foot house, which should be walled with stone; the flues of which, should extend around the house about four feet distant therefrom—meeting on the opposite side. After getting three feet in the house, I make holes on each side of the flues, three inches square, eighteen inches apart, through which the heated air will escape, and being done horizontally, will be regularly diffused through the house. These holes should not be opposite each other, as that will prevent in some degree, the heat from escaping regularly.

The bottom log or sill of the house, should be at least two feet above the top of the flues, to insure a non-communication of fire: that being secure, very little fear of fire need be apprehended from any other source. The space from the flue to the log should be filled with mud. A house intended for flues (for obvious reasons,) should be set on a hill-side.

I would now observe that Mr. Gay commenced the use of these flues in 1824, without a knowledge of their previous existence; and from actual and repeated experiments, considers them perfectly safe from fire. Sparks are not very common objects of perception in the house: and I believe a torch is necessary to set tobacco on fire. That heat and smoke cannot exist together, (when coming in immediate contact,) has been most happily illustrated by the fact that the latter becomes very nearly extinct in passing the flues before entering the house.

I saw some of Mr. G's tobacco a few days since, and from its fine appearance and flavor, concluded that it had not been subjected to the deleterious effects of smoke. That the time and labor required in attendence, is less than in the common mode cannot be doubted—when I say that one hand can, with ease, keep up the heat of three or four houses, were they half a mile apart—his only care being, to replenish the fire-places with fuel. I would here remark, that tobacco should never be suffered to pass through a sweat while undergoing the process of *yellowing*; and this should occupy a day or two. I believe the primary cause of good tobacco curing of a dark color, arises from the absence of the requisite quantum of air at that crisis. It would therefore be prudent to remedy the evil by removing the cause, which should be done [by making openings] about five or six feet above the base of the house. Perhaps openings in other parts of the house would be equally effectual.

This subject seems to merit some additional remarks: but feeling a disposition to advert to the practice of another very intelligent and practical farmer, the imitation of which, I think would be attended with profit to the fraternity generally, must desist. In consequence of a great press of business in September 1834, (which is common to all industrious planters at that juncture,) his tobacco enjoyed the privilege of remaining in the field about two weeks later than was intended. Having by this time built a house and completed other requisite operations, the weather admonishing him that frost was approaching, he went into his field and uttering the injunction to "cut boys, and spare not," which was rigidly enforced, very few plants escaped the attack. It was in every respect ripe for the knife. He realized the excellent price of $19 per cwt. for his best, and $10 for his *lugs*; while the maximum price of that of his neighbors, produced on equally good land, did not exceed $9 or $10. It is a notorious fact that many planters cut their tobacco through fear of a frost, when it is improving more rapidly than at any former period. I think this course unwise, believing he would be a gainer by suffering it to stand till thoroughly ripe; even were he to lose one crop entire out of six or seven. Judging from past experience, I think no planter should make more than two, or at most three cuttings under ordinary circumstances. In support of this practice, I would only add a few remarks; though it would justify many. In the first place, its quality and quantity is greatly enhanced. This is a very direct and effectual method to increase the price as shown above. The open space caused from one large cutting supersedes the necessity of carrying the tobacco to the edge of the field, as a cart may pass and receive its load, without the remainder sustaining much injury. It is obvious that time and labor will be economized. It enables the planter to fill a house, or houses, from a single cutting. The advantages derivable from this circumstance are numerous and apparent to every curer of tobacco, and need not a comment from me.

I will mention one more advantage attending this plan—and leave others to be supplied by the reader. Tobacco cures of a much better color after the middle of September, than earlier. I beg leave to make assertions without proof, as the methods recommended, will, (when tested) be found correct. To obviate the necessity of cutting the plants topped first, sooner than those subsequently topped, I would recommend that they be crowned with a greater number of leaves. "Solid and practical wisdom consist, in pursuing valuable ends by the most appropriate means."

ROBERT D. KEY.

For the Farmers' Register.

THE WEST.

Glencoe, Alabama,
April 4, 1836.

Agriculture.

Agriculture in new countries is carried on in an exhausting and improvident manner. To an inhabitant of an old state, where economy is better known, it is quite shocking to observe the prodigal waste of timber consumed in clearing a western plantation. Entire primitive forests, girdled, wither, and rot away—food for the woodpecker species which is very numerous in this country—or are at once felled with the axe, and burned in heaps. Thus, millions of sturdy oaks and giant hickories through whose tops the winds of many winters have whistled, are transformed in a brief hour to thin blue smoke, and mere volatile gas.

The land once cleared, is exhausted by an uninterrupted succession of crops—until, the product yearly growing less and less, the proprietor becomes dissatisfied, and sells out to some less opulent or less avaricious neighbor, and removes to some new elysium in the west.

There is nothing new under the sun:—the same process has been going on in all the southern states. The greedy havock of a wasteful, merciless system of agriculture, has tended to impoverish all the states bordering on the Atlantic—none of the soil retains its original fertility, except the deep alluvial banks of the rivers, and I suppose even they begin to feel the effects of wear and tear.

The consequence of all this is two-fold: first—necessity has driven a considerable portion of the people of these state to emigrate westward—and secondly—a re-action has ensued in the system of agriculture; and means are taken to renovate the constitution of a deteriorated soil. Marl and other modifications of lime are brought into use—science and the press lend their aid, and at length "the wilderness blossoms like the rose."

Emigration.

From Jamestown westward, the successive surges of emigration have been each subjected to the same train of influences, and the same effects have repeatedly resulted. The perils of a pioneer life make the early settler brave—exposure makes him hardy—and labor makes him robust. These dangers, difficulties and fatigues, however, while they taught the necessary virtues of patience and fortitude, to those who had emigrated, would have deterred others from following in their wake—had not their stern aspect been relieved by the many pleasing features and singular advantages of a new country—the charm of adventure, the fresh and lovely form of nature, the fertility of a virgin soil, and perhaps the escape from recollections which distance alone could efface.

The life of Boone—the pioneer of pioneers—is an example of the pains and the pleasures, the lights and the shadows of emigration.

The obstacles however which did not stop, tended much to repress the tide of emigration; had it been otherwise—had the west held out enticements alone—the Atlantic states would have been almost emptied of their population, which would have been precipitated upon the west.

The current of emigration, at first attenuated—gradually widens, as the obstacles to its course, grow less. In the meanwhile the population of the older states increases, until they can afford to part with a portion of their inhabitants. This is however the case, not so much in the states south of Mason and Dixon's line, as in the north. The peopling of the valley of the Mississippi is the grand moral phenomenon of modern times. Like scenes may have been witnessed, when the progeny of Noah peopled the eastern hemisphere: but we may doubt whether ever, in any age, a tract of country so vast, so productive, and watered by so many navigable streams, has been filled up in so short a time with a population so civilized, as that of the basin of the Mississippi.

C. CAMPBELL.

CORN CULTURE IN BOTETOURT.

To the Editor of the Farmers' Register.

Peyton Hall, Botetourt,
April 17, 1836.

* * * * *

Instead of closing my letter with this matter of business, I will submit to you and your intelligent subscribers, as far as the limits of this sheet will allow, the outlines of my mode of culture in several crops. It is not my intention to give the reins to my fancy, that your readers may be amused with its visionary creations; much less is it my design to insult their good sense, as is too often done, by tediously explaining to them, as recent discoveries and untried experiments, systems and modes of culture, familiar to every intelligent agriculturalist since the days of Columella. My object is to give you, in a plain and unambitious style, the mode of farming pursued by myself, that it may be scrutinized by others, compared with their own, and its faults detected and made known. This manner of giving individual systems, and the results of individual experience, seems to be the only true means of advancing the science of agriculture, and placing it on a solid foundation. Without dwelling longer in preliminary observations, I will proceed to give you in the first place my mode of managing the corn crops. And as a further guard against every thing merely speculative—I will give you a transcript from my farm-book, of the process pursued by me, in its cultivation last year.

I had about 70 acres in corn, not three of which had a dressing of manure, and all old upland, any 20 acres of which taken together, would have been, as to natural soil or improved condition, a fair average of the whole farm. The larger portion was in wheat the preceding year, 9 acres had been in clover three years, and suffered to fall and rot for the last two; and 10 had been in corn the year before. The whole was fallowed in the fall and winter, with the Davis' plough. In the spring it was cross-ploughed with "bull-tongues," a species of plough between the shovel and coulter, uniting most of the advantages, and free from the objections of both. I then levelled it with large harrows weighted, and drawn by two oxen. The season for planting having by this time arrived, we listed it with shovel ploughs, having a board nailed in front to widen the furrows; in which furrows, coulters followed immediately after the shovels. Upon hill-sides I planted in horizontal drills five feet apart, with the corn dropped at intervals of from 15 to 18 inches in the row. When the land was level or greatly undulating, it was checked four feet each way. The land being thus prepared, we selected our seed corn with care, and steeped it for 24 hours in a liquor composed of drippings from rich manure, with plaster, salt and soot, in large quantities. As the *droppers* required it, we took it from the liquor in its wet and swollen condition, and rolled it in plaster. The checked corn was covered by foot, with the exception of a few rugged places, and the drilled with the five toothed cultivators. So soon as the corn became sufficiently visible to mark the rows, we commenced working it with the bull-tongues, and continued without cessation: so that no portion of the crop was suffered to remain more than eight days unworked, until it was laid by. The only change in the cultivation, was about the time the change in the color of the wheat, began to admonish us of the near approach of harvest, when, we ran our cultivators, or scarifiers as they are called by some, over the whole; and left it perfectly smooth and free from weeds. The pressure of my tobacco prevented my blading or topping any, except a very inconsiderable portion of the corn. The yield was upwards of 800 barrels, making an average of 12 barrels, or 60 bushels, to the acre. My manager measured an acre of the drilled corn upon a rough, but rich hill side, and it shucked out nearly 16 barrels, (78½ bushels) of shelled corn. The season was generally speaking favorable.

From this unadorned skeleton of my mode of culture, it will be observed, that my first great object is, to prepare the land thoroughly, before planting. 2d. To have my seed stimulated in their early growth, by the most powerful and concentrated manures. 3d. To keep the ground as I started with it, in perfect tilth, and entirely clean. 4th. To use such implements as cut very deep, with little labor to the horse; which being necessarily narrow, will pulverize the soil, and make it more permeable to heat and moisture: a circumstance to which the ingenious Tull perhaps attached too much consequence—but one which I am satisfied the opponents of his theory undervalue. Another object in using this narrow, deep cutting plough, is, that from the beginning it cuts off all the surface roots in the balks, and makes the corn strike deeper; and thus, renders it less liable to be affected by the vicissitudes in the seasons. I have observed that whenever corn is ploughed, after being neglected until the grass and weeds have sprung up, and especially when the working is followed by dry weather, it is invariably injured seriously. Sometimes it is fired so badly, as to cut off the crop by half what it would have been, had it been left to the weeds—and occasionally it produces almost a total failure. This, of course, arises from the corn being irregularly worked—and when worked, the surface merely scratched over. The roots are suffered to spread themselves uninterruptedly near the surface in the balks; and these being broken necessarily in the after working—the corn is thus deprived of its principal sources of moisture and nourishment, and suffers immediately. When I cease working at harvest, I never put a plough in afterwards; believing that the time has then arrived when the crop requires that its roots should be suffered to extend themselves *uninterruptedly* in every direction, in quest of food to support its increased size. During two short dry spells which we had last season, my corn continued to preserve a deep blackish green color, whilst that of my neighbors was a good deal injured.

I have thus in obedience to your appeal to your subscribers, contributed my mite of facts upon one branch of our agriculture. Should you excuse the negligent and hasty manner in which it is thrown together—and consider it of any value to your paper, you can publish it; and at some more leisure moment, I will extend my remarks so as to embrace the other crops cultivated by me.

Your obedient servant,

W. M. PEYTON.

"VIRGINIA CORN AND COB CRUSHER AND GRINDER." GENERAL REMARKS ON THE RECOMMENDATIONS OF NEW PATENT MACHINES.

A correspondent requests of us information respecting the above named machine, which is spoken of highly, but only in general terms, in a late number of the Farmer and Gardener. The maker's name is Jas. L. Baldwin, but his place of residence is not stated. Any particular information respecting the machine from a disinterested source, if likely to be useful to the public, will be thankfully received for this publication. If this notice should meet the eye of the patentee of the machine, he is requested to write to N. Herbemont, Esq. S. C., and state particularly its performance, price, &c.

We also request, for another correspondent, information (derived from experience,) of the best and cheapest corn-mill, to be worked by horse power, and on a scale suitable for the wants of a single large farm.

We use this occasion to say, that similar information, founded on sufficient experience, and sustained by the voluntary communications and signatures of disinterested and respectable individuals, will at all times be received and published in this journal, with pleasure. But we have discouraged such communications, and will continue to refuse to publish them, when they are not sustained by names of known respectability, and unless the object appears to be to serve the public, and not merely to help the sales of the owner of a patent right. Without such strict regulations, many of our pages would be filled with the certificates, (in form or substance,) of the superior advantages of new patents; and which we know, nine times in ten, even of those the most abundantly supported by certificates, prove to be of little worth—and often of none. Such "communications" would be, in fact, mere advertisements in disguise—differing from ordinary advertisements in these respects however, that they would not be paid for, and that from their position, and the editor's apparent sanction, they would have far more authority, and effect, than any advertisement in ordinary form—and the publication would thereby serve the more to aid deception, if the invention was indeed worthless.

Every one knows that the names of respectable individuals may be obtained in recommendation of a new machine, with as much ease as to a quack medicine—and that they are worth, in the general, as little in the one case as the other. On our advertising sheet, or covers, any such advertisements may be placed, on the responsibility of those, who sign and pay for the advertisements. But information respecting those or other machines or inventions, which appear in communications to the Farmers' Register, must stand on very different, and much higher authority. It is a matter for regret, that we have been enabled to publish so few communications on this subject. But it is far better that they should be too few than too many—as by a free admission to such advertisements in disguise, this journal would be made the channel of communicating to its readers ten times as many falsehoods as truths, respecting new patent machines and implements.

These remarks are, in part, a suitable introduction to the list and descriptions of new patents which follow, and which will be continued regularly hereafter, if the plan should be approved by our readers. The Journal of the Franklin Institute, to which we shall be indebted for these descriptions, contains monthly lists of all the new patents issued from the Patent Office, and at as early date, as circumstances permit. The editor, Dr. Jones, who prepares these lists, and accompanies them with his comments, possesses great and peculiar facilities for the task--and therefore his opinions, as to the value of new inventions, deserve much respect. A large proportion of these patents are for inventions or alleged improvements of machines, or implements, designed to aid processes in agriculture, or domestic economy—and it is this class alone, that we shall extract for re-publication. By this means, a notice of every new invention will reach our readers, before a travelling agent offers it for sale, and the service rendered by the earlier information to farmers, will be of much more value, perhaps, in directing what to reject, than what to approve and purchase.

Extract from the Journal of the Franklin Institute for April 1835.

MONTHLY LIST OF PATENTS FOR IMPROVEMENTS IN MACHINES OR IMPLEMENTS, OR PROCESSES CONNECTED WITH AGRICULTURE OR, DOMESTIC ECONOMY.

[The whole number of patents issued in September 1835, (the last monthly list yet published,) amount to 67, of which the following 21 are of the class embraced by our plan for this and future monthly republications.]

For a *Lever Press;* Jonathan Payne, Russelvile, Logan county, Kentucky, Sept. 9.

This lever press, it appears, has been the subject of an arbitration under the ninth section of the patent law of February, 1793, relating to interfering applications, which terminated in favor of the above named patentee. The construction of the press is pretty clearly made known in the specification, but no claim is there made to any part of it. It is intended for cotton, hay, tobacco, &c. &c. and is constructed as follows. A stout sill, from 30 to 50 feet in length, has, rising from the middle of it, two upright pieces of timber 10 feet high, which serve to sustain a lever, or beam, between them of the same length with the sill, and measuring 12 by 10 inches. A stout pin, sering as a fulcrum, passes through the upright cheek pieces, and through the beam. Either end of this beam may be drawn down by means of a rack and wheel work, the latter being sustained by the sill, and the former depending from the lever. A pinion, probably of 4 or 5 inches in diameter, turned by a winch, gears into a wheel of 7 feet diameter, having a pinion on its axle of 6 or 7 inches diameter, which acts upon the rack.

No directions are given for using this press, but as only one end of the beam can be employed at a time, the rack and gearing must at one end be used to raise,and at the other to depress the beam, between which and the sill the pressing must, necessarily, be effected.

For a *Churning and Washing Machine;* Thomas Ling, Winthrop, Kennebec county, Maine, September 9.

This is a swinging, or pendulum churn, which really has some novelty about, it and even in this fact alone, their is something cheering, as originality has long been a rare element in churns and washing machines.

The churn is a round tub suspended vertically within a frame, so that it can swing like a pendulum. A vertical shaft within the tub carries dashers, as it is the case in many other churns. To cause the dashers to operate, the shaft projects above the tub, and a string, or cord, passed once or twice round it, the two ends of the string being attached to opposite sides of the frame; on vibrating the tub, the string operates like a drill bow, as will be readily perceived. The claim is to "the modification and combination of the swing or pendulum churn and the dasher, for churning and washing."

For a machine for *Washing Clothes and Fulling Cloths;* Orrin D. Wade, China, Genesee county, New York, an alien who has resided two years in the United States, September 9.

The clothes are to be put into a box, or trough, through the lid of which there passes a row of upright shafts having flat blocks of wood on their lower ends, which blocks nearly touch each other. A row of horizontal levers, hung upon fulcra, and acted upon by lifters on a revolving cylinder, cause the shafts and their blocks to rise alternately, whilst springs above the levers force them down. This constitutes the whole apparatus, to which no claim is made.

For a machine for *Shelling Corn;* Elijah Morse, Knox county, Tennessee, September 9.

A roller of cast iron is to revolve horizontally, and upon it there are to be rows of teeth which pass betwen others on the frame. The feeding, as we suppose, is to be effected by placing the ears upon a concave, hinged cover; whence they are to roll, or be forced, against the revolving shaft; a winch occupies one end of this shaft, and a fly wheel the other. The description is very imperfect, and the drawing, although well executed, must certainly show the teeth of the machine. and some other parts, incorrectly. The claim is to "the application of the roller, and the general construction of the whole machine."

For the *Application of Hydraulic Cement, &c,;* Obadiah Parker, city of New York, September 9.

This is an *application patent,* like most of, or nearly all, those obtained for the use of cement. By an application patent, we mean one which might be taken for applying a plaster of some approved salve to the head, another being taken for applying it to shoulder, and others for all the various divisions and subdivisions of the superficies of the corporeal system. In the present instance are enumerated, "house and store cellars, vaults, small wood-cellars, vegetable cellars, cellars under side walks in cities, vaults in cemeteries, and vaults for milk, and garden cellars; the construction of walls, floors, and roofs of buildings, and walls for enclosure; the construction of locks and guards for canals; the construction of sinks for kitchens, and other purposes;" "which has not been known or used." Indeed! there is novelty in this information, and this, we are well convinced, is the only place in which we shall find it, although eighteen pages are occupied by the specification of these applications, and the claim thereto.

For *Making Artificial Stone or Marble;* Obadiah Parker, city of New York, September 9.

Pulverized granite, or pulverized marble is to be brought to a proper consistence for moulding into the required form, in combination with water lime. This constitutes the *inventian.*

For the *Formation of Artificial Stone and Marble for Architectural Purposes;* Obadiah Parker, city of New York, September 9.

We have again about a dozen pages devoted to the mode of forming various ornamental and useful articles, pavements, &c. &c. by modes analogous to those described in the preceding specifications, and having consequently, the same claim to novelty, or rather to antiquity. Should the patentee think himself aggrieved by the foregoing remarks, a thing which we do not anticipate, we will offer him a reference to a gentleman in New York, who can tell him much more about the combinations of water lime, and the formation of artificial stone, than he now knows; and will give him ample proof that our animadversions, or rather intimations, are founded in perfect truth.

For a *Water Wheel;* Jehiel W. Dart, and Stephen Wood, Truxton, Cortland county, New York, Septembar 9.

This is a kind of re-action apparatus, in which two wheels differently constructed are to be placed one close above the other on the same vertical shaft; the first of these wheels has four floats which revolve in a circular drum, through the side of which the water enters tangentically to the circle, and strikes the floats; after performing its labor there, it escapes through a centre hole in a horizontal partition, and enters the ordinary reaction wheel, passing through its curved channels, and escaping at its periphery.

The claim is to "the increase of power which is obtained in the above arrangement of the central discharges, or whirlpool wheel, and the reaction wheel." This is rather an inverted claim, being to the end, instead of to the means; but this in the present case is a thing of little consequence.

For an improvement in the *Coffee and Corn Mill;* Elijah Morse, and Caleb Putnam, Knoxville, Tennessee, September 9.

Nominal *improvements* are so easily made that it requires no talent whatever to be author of them, and such is that which forms the subject of the present patent. The mill in which the pretended improvement is made, is the common cast iron mill with a conical shell and nut, in its unaltered state, excepting only that the patentees "claim as their own invention, and not previously known in the above machine, that the furrows in their mill run straight through, and not spiral, as in all other mills." It does not require two grains of mechanical knowledge to enable a person to decide that this change deteriorates instead of improves the mill: nor is it necessary to have dipped deeply into the logic of Aristotle, or of Watts, to arrive at the conclusion that it requires one and one to make two, yet in the case before us we are to admit that the inventive genius of two individuals might be put into requisition to devise one set of straight furrows.

For *Supplying and Regulating the Draught of Air to Fire Places;* Robert Mayo, city of Washington, September 9.

Pipes, or tubes, of tin, or other material, which may be from one and a half to three inches in diameter, are to lead from the lower part of a building, up the outer walls, their upper ends opening under the grate or fire place. Such pipes may be added to buildings already erected; but in the erection of new ones it is proposed to form these ascending air channels within the thickness of the walls, their lower ends opening to the external air, and their inner to the fire place. Valves to regulate the quantity of air admitted, may be constructed of any suitable form.

The claims made are "*First.* The arrangement, combination of parts, and adaptation of the air pipes, or tubes, to ascend the outer walls or chimneys of buildings, or apartments, and penetrate the same, contiguous to fire places. *Second.* I claim the construction of air channels or flues in the masonry of chimneys, or the walls of buildings, to ascend from a lower stratum of atmosphere and terminate near to, or in, the fire places."

With the exception of extending the tubes to the lower part of a building, it will not be pretended that there is any novelty in this contrivance, the practice of admitting air from without, to feed fires, being old and common; but even the ascending tubes themselves are not new, they having been frequently recommended and applied to the supply of fires for the purpose of ventilating cellars, and other lower apartments; it may be said, however, in the present case, that this is not their object, that object being merely the supply of the fire; without inquiring into the validity of this allegation, it is proper to ask what are the advantages of these descending pipes, and we believe that this is a question which cannot be satisfactorily answered. The patentee says that we shall "thereby create a constant current through the tube, or pipe, of a strength proportionate to the height of the pipe, or the greater weight of the medium of atmosphere at the lower extremity, or inlet, than that at its upper extremity, or outlet; which takes place upon the same principle of pneumatic or atmospheric pressure, which forces water in a tube, or well, to rise to the height indicated by the known weight of the atmosphere: and this principle is equally applicable, of course, to the air channels, or flues, constructed in the masonry."

The foregoing may pass with the illiterate for good reasoning, but it is altogether false and unfounded. The pressure at the opening of the tube within the room will not be altered by the extra height of the atmosphere above the lower opening, the column within the tube being a perfect balance to this; the whole trouble and expense of the tubes may, therefore, be saved, together with the cost of a patent right to do that which is in itself altogether useless.

For a *Washing Machine;* James Lombard, Readfield, Kennebec county Maine, September 9.

The trough of this machine is a concave semi-cylinder, closed at the ends, and fluted along the semicircular part. The *rubber*, which is to act upon the clothes, is also a semi-cylinder, which passes into the trough, and is suspended by an axis at, or near, its centre. This rubber is either fluted, or covered with fluted rollers, passing from end to end on its curved surface. It is so hung, by means of a strap, or chain, as that it may recede from the trough, when too great a quantity of clothes may be between them, and also to admit of its continued pressure upon them. The rubber is to be made to vibrate by means of a handle. The claims are to "the form and application of the rubber, or interior cylinder—the mode of suspending and operating the rubber, and the application of the strap, or chain, whereby the pressure is regulated, and the rubber allowed to yield."

For a *Machine for Breaking and Cultivating Sward Ground;* Guy Gray, Industry, Somerset county, Maine, September 18.

A square frame is made to contain a roller, like that used for rolling ground, and a tongue is attached to the frame to draw it by. The roller, as described, is four feet long, and is set with teeth in twelve rows, containing, alternately, five and six in a row; the teeth, which are pointed, are seven inches long, but curved so as not to project more than six inches from the roller. There are teeth, also, on the back rail of the frame, so set as to allow the roller to pass between them. The patentee says, that when this is "drawn over the closest sward land, it breaks it more thoroughly than any other machine known to him, so that the ground may be afterwards ploughed with less than half the strength of team otherwise required, whilst it is left in a much better state for cultivation."

There is not any claim made; the whole must, therefore, be considered as new, or the patent cannot be sustained.

For a *Plough for Cultivating Corn and Potatoes;* Peter Stahl, and John Diffenbacher, Turbut township, Northumberland county, Pennsylvania, September 18.

This instrument is made in the form of what is commonly called a cultivator, and is furnished with six shares, affixed to standards twenty inches in length, for the purpose of mounting the beams high up above the ground. For the particular form of the shares, the model is, incorrectly, referred to. The following is the claim.

"The shares, or mould-boards, which are each cast in one piece, and forming a coulter, share, and mould-board. The high standards, which carry the plough beams so far above the corn, or potatoes, as not to break it down so long as it needs cultivating. The placing these in such a manner as to plough, or cultivate, both sides of a single row of corn, or potatoes, at one and the same time of going over the same."

For a *Machine for Planting Cotton;* Robert S. Goodman, Ballsville, Powhatan county, Virginia, September 18.

This is one of those classes of machines, the individuals of which can scarcely fail of exhibiting a strong resemblance to each other. They run upon wheels, which are fixed on a revolving shaft, or axle; they carry a hopper, into which the seed is put, and which falls through an aperture regulated by the revolving axle. There is a share in front of the machine, to open a furrow, and a scraper behind, to cover the seed. These are general elements, which are common to all, and are common property; what is left, therefore, to ingenuity, or fancy, is to devise those minor arrangements upon which the more or less perfect action of the machine is dependent, and which have usually too little of originality, or skill, to render it worth while to follow them out, and such we think the case in the present instance. The claims are to "the manner of using the wheel at the perforation at the bottom of the hopper. The revolving shaft, with the pin, or pins, and conductors, attached to it, to be set in motion in the manner described."

For a *Machine for shelling Corn;* James S. Harris, Poultney, Rutland county, Vermont, September 18.

We apprehend that this will prove to be one of the least valuable of all the corn shelling machines, from its being inconvenient and laborious to operate with, whilst it will not be recommended by its efficiency. It consists of a fixed rubbing board, set with teeth, or otherwise furnished with projecting points, and a movable rubbing board, to be worked up and down by a lever, which is moved by the right, whilst the feeding is to be performed by the left hand. No other provisions are spoken of, nor is any claim made.

For a *Cradle and Mowing Machine;* Edward Badlam, Jr., Chester, Windsor county, Vermont, September 18.

By means of a face cog wheel on the inside of one of the wheels upon which the machine runs, motion is given to a horizontal shaft, the opposite end of which gears into a bevilled pinion on a vertical shaft, which sustains scythes, revolving horizontally. Small wheels on the underside of the fixtures of these scythes, run upon the ground, and serve to raise them over knolls, whilst springs above them keep them in their places; the grass, or grains is received upon fingers, which conduct to a rack.

The claim is to "the springs, with the fixtures for enabling the scythes to pass over small knolls; the fingers and the rack, for the purpose of catching and laying the grass and grain, after being cut by the scythes."

For machinery for *Cutting and Collecting the Heads of Grain, and Grasses;* Jacob Peck, and Daniel Ashmore, Jefferson county, Tennessee, September 18.

The machine is intended to be driven forward like a wheelbarrow, when grass seeds are to be collected; for the heads of grain, horses are to be employed to *drive* the apparatus, which, in its general form, resembles a cart. The machine must be mounted upon wheels of such height as will suit the grain, or grass, the seeds of which are to be collected. The heads, as the machine advances, are to be received between a row of lancet shaped knives, flat on the top, and bevilled to a sharp edge from below. Fingers of wood, or of metal, may also project forward, the better to guide the heads to the knives. Above the knives there is a kind of revolving reel, set in motion by bands and whirls, connected with the running wheels of the carriage; this reel, or open cylinder, carries knives, which come nearly into contact with the row of fixed knives before spoken of, which cut off the heads of the grain, or grass. There are various appendages to, and modifications of, this machine, described in the specification, which we cannot wait to notice.

"What we claim as our invention, are the lanceolate knives, or, in the stead of them, the series of fingers, with other knives, to steady the grain in cutting—the revolving wheel, with strikers, knives, and canvass—the collecting hand with its wheels, crank, lever, rest, and adjustment—the pulleys and band to drive the revolving wheel—the propelling power behind—the principle of the governor of the rudder to give direcrection to the machine; and the application of the whole to the use and purpose of cutting and collecting the heads of grain, leaving the straw on the ground, and in like manner saving clover and other grass seed."

We believe that it will be proved upon investigation that this claim embraces too many particulars, and thus includes things which have been before well known and employed. Rows of lanceolate knives are not new; the propelling from behind, in grass and grain machines is not new; the driving a wheel by a band and whirls is not by any means a fit subject for a claim; yet there is certainly enough in the machines upon which to have procured a valid patent.

For *Cleansing Clover and other Grass Seeds;* Hiram Holt, Weld, Oxford county, Maine, September 27.

A cylinder, which may be two feet long, and the same in diameter, is to be covered with sheet iron, pierced so as to constitute a grater. Two concave shells, with like surfaces, are to be placed one on each side of this cylinder, leaving an opening at top for feeding, and at bottom for the escape of the seed. The cylinder, whose axis is horizontal, is to be made to vibrate backward and forward, to rub out the seed. The concaves are adjustable by screws. The claim is to this particular action of the cylinder, furnished with a concave on each side.

For an improvement in the *Grist Mill;* Owen Moses, Malone, Franklin county, New York, September 26.

The stones in this mill are to run vertically, and are both of them to revolve, but in opposite directions. The shaft of one stone is to be a hollow tube, through which that of the other passes, and a horizontal crown wheel is to mash into wheels on each of these shafts. The feeding is to be through the eye of one of the stones. There is no claim, and if it is supposed that the revolving of both stones, or the mode of gearing to effect this, is new, a little inquiry would manifest the erroneousness of such an opinion.

For a *Washing Machine;* John J. and Ebenezer C. Milliken, Winthrop, Kennebec county, Maine, September 26.

A trough is to be made in which there are to be two sets of vibrating stocks, of the ordinary form; a double crank shaft, the cranks at right angles with each other, is to work the levers by which the stocks are suspended; the cranks pass through slots in these levers, and are furnished with friction rollers, thus dispensing with pit-men, but by a much worse contrivance.

Claim.—"The application of a crank directly to the arms of the stock, in such a manner that one stock only shall press at a time. The application of friction-rollers to the crank, as above described, &c."

For a machine for *Shaving Shingles and Staves;* William H. Wilkinson, Wayne, Warren county, Ohio, September 26.

The articles to be shaved are to be forced over irons, on the face of a bench. Two vertical wheels, acted upon in a way described, and shown in the drawing, serve to carry the articles over the irons. There is nothing in the machine worthy of special notice. The claim is to "the arrangement of the wheels acting upon the driver."

For a *Machine for Dressing Hoops;* B. Kimball, A. Pevey, and F. Spalding, Petersborough, Hillsborough county, New Hampshire, September 18.

A wheel furnished with cutters on its face, near to its periphery, is made to revolve by means of a mandrel, like that of a lathe. A gauge stands in front of the cutters, having a roller, against which the outside of the split bears; this gauge is capable of being made to recede, by means of a lever, so as to allow the necessary increase of thickness in case of knots, &c. The following is the claim. After stating the various modes of arrangement which may be adopted, the patentees say: "We do not, therefore, claim the individual parts of this machine, as they have all been used under other combinations, and for various other purposes; but what we do claim as our invention, is the construction of an instrument for dressing hoops, made and operating, substantially, in the manner herein set forth; having a revolving cutter wheel, a shifting gauge, and the auxiliary appendages which give to it that character by which it is distinguished from other machines for the same purpose."

This machine has, we are informed, been found of very great value in its application to the purpose for which is was constructed.

From the Genesee Farmer.

ROLLING SEED BEDS.

Nothing protects young turnips, cabbages, and other cruciferous plants, so effectually from the depredations of the fly, as the operation of *rolling*. For when the surface of the ground is thus rendered smooth, the insects are deprived of a lodging place under the clods of earth, and disperse. This effect may be observed in turnip fields;—where the soil is finely pulverized, and the surface consequently left smooth, the crop is generally little injured, but where the surface is cloddy, it is often almost destroyed. But as rolling can only be done to advantage on light, or else on tolerably dry ground, where the soil is heavy and moist it cannot be resorted to; and as it is not always, when practiced, completely effectual in repelling these insects, it is commonly advisable to provide the additional remedy of air slaked lime, which should be at hand, to sprinkle over the plants whenever the fly may appear.

From the Genesee Farmer.

STINGLESS BEES.

We have seen in some late journal, an extract from Loudon's Gardener's Magazine, in which, speaking of the bee of New Holland, he says—"The native bee is without a sting, and not much larger than a common house fly. It produces abundance of honey and wax, but has not yet been subjected to cultivation; and from its small size, and building on high trees, probably never will be so."

A late traveller in Mexico has given an interesting account of the native Mexican bee, which like the New Holland one is stingless, but has been completely domesticated, and forms an important addition to the means of subsistence and comfort of the inhabitants, Indians as well as Spaniards. The Mexican, in appearance much resembles the wild bee termed the upholsterer or leaf-cutter bee, the one that commits such ravages on the leaves of the rose bush while making preparation for depositing its eggs in the summer, except that it is rather smaller. The natives in the interior manufacture their hives from clay, in the shape of large earthen jars, and nothing is more common than to see a number of these hives placed on a shelf under the projecting eaves, and over the door of the Indian cottages, where they are half buried under climbing and fragrant blossoming vines, the bees perfectly harmless, and their rich stores ever ready at command. Whether the Mexican bee could be brought to endure our northern winters may be doubted, but that it would prosper in any of our southern states cannot reasonably be questioned, and we have often regretted that no attempt has been made to naturalize it in that section of the United States. Once introduced, it would rapidly spread; and like other animals and plants, the natives of a warmer climate may gradually become capable of enduring ours, and thus eventually supersede the useful, industrious, but sometimes dangerous domestic bee of northern latitudes.

G.

SOME OF THE EFECTS OF WEST INDIAN EMANCIPATION, AS STATED BY THE FRIENDS OF THAT MEASURE.

The following extracts form a small portion of a long and interesting article in the last London Quarterly Review, on the the "Foreign Slave Trade." The reasoning and the admissions are the more worthy of notice, as proceeding from a writer who (in the essential part,) approves of the recent and important measure of abolishing slavery in the British West Indies—and also, for being presented in a work of such high authority as the Quarterly Review. The results already found, in the short course of this great experiment, and still more the results anticipated by the reviewer, are such as any intelligent opposer of the abolition of slavery might have urged. But views from such a source would have been suspicious—and could not have compared, as authority, with these *precious confessions*. We wish to call the attention of our readers—*northern* as well as *southern*—to the following opinions, which will be found in other words in the extracts below, and some of which (especially on the probable extension of the African slave trade,) are enforced at length in the omitted parts of the review. These opinions are—

1st. That the abolition of slavery in the British West Indies has served, and still more *will* serve, greatly to increase the profits, and of course the prices, of slaves elsewhere—and, in consequence, will tend to extend the African slave trade, wherever that trade is permitted to exist.

2nd. That the payment of wages (though at rates much higher than their former cost of purchase and maintenance) will *not* induce the emancipated slaves to furnish any thing like the former amount of labor.

3rd. That a large proportion of the sugar (or other) land will be thrown out of cultivation, owing to the increased expense of tillage, and the diminution of laboring force.

4th. That the occurrence of insurrections of slaves, and their consequences, where slavery continues, is counted on as one of the compensations to British interests, for the disadvantages sustained from emancipation in the British colonies.

The last named argument, though (for good reasons) touched but slightly and tenderly by the English writer, deserves the full consideration of the people of this country. It is unquestionably true, that, in this respect, the commercial interest of Britain, (putting aside the groundless but not less operative feelings of commercial and political jealousy,) will henceforth concur in action with the movements of the pretended philanthopists and fanatical abolitionists, of both England and the United States. If the leading and most active abolitionists in our northern states are not actually hired to work for the gain of British employers, they well deserve to be paid the wages for such service: and there will be no lack of such efforts, prompted and sustained from abroad, so long as the most selfish and base interests, are to be best subserved by words and acts which go forth in the guise of pure morality, religion, and disinterested love for the human race. They who rob and murder, professedly in the name of virtue and religion, and for the glory of God, are an hundred fold more dangerous than ordinary villains who pretend to no better motive than the love of gain; and far more are their powers for mischief increased, when, in addition, they believe (as most of our anti-slavery fanatics do,) in the truth of their pretensions, and the holiness of their purposes and acts. From our slaves, of themselves, and from any political effects of the institution of slavery, as it exists in the South, we have *nothing* to fear—(the throats and the purses of the property-holders of New York are in much more danger from their mobs of *free men* and the spreading of agrarianism:) but the South, *and the Union*, have every thing to fear (and danger far greater than any from servile insurrections,) from the restless, mad, and *sustained* action of the northern abolitionists.

From the London Quarterly Review.

We have already had occasion to observe how largely the slave-market has, of late years, thriven, under the expectation of the foreign planters, that the relaxation and discontinuance of slave-labor in the British colonies must be followed by a diminution of British production, and by a consequently increased vent for the produce of the foreign plantations. These expectations (on the strength whereof we understand that the prices of slaves in Puerto Rico and the southern United States have already risen between 25 and 30 per cent.) have proceeded upon the very great difference between the cost of producing sugar by free and by slave-labor. In some parts of Guiana, St. Vincent's, Trinidad, Mauritius, and Jamaica, the prime cost may probably be low enough, by reason of the soil's fertility, the facilities of carriage, and other local advantages, to promise a continuance of the sugar-crops (notwithstanding the additional cost of free-labor), at a price not too high to find some purchasers; but on all the secondary class of estates, the cost of production, under the added disadvantage of free labor, must henceforth (unless relief can be given in some essential point, such as that of the restrictions on West Indian intercourse) be too heavy to be remunerated at any price which, under the present duty, the consumers, could permanently pay. Nay, even granting the fullest relief from restrictions, and admitting that, *in general*, the planter may be able to procure free labor provided he give a liberal price for it, we cannot shut our eyes to the certainty that there are *very many* plantations which are too little productive to afford, at best, anything like a free-labor price, and which, in any conceivable circumstances, must absolutely be abandoned; in fact, we can hardly calculate this abandonment at a proportion so low as one-sixth of the whole; which would exhibit a discontinuance of production, to the extent of 38,500 tons of the 231,000 now raised, being more than the whole quantity of West Indian sugar consumed in the markets of the European continent. On this aubject we invite particular attention to the simple matter-of-fact statements of Mr. Innes in his Letter to Lord Glenelg—*passim.*

The first consequence then, of the recent abolition of compulsory labor in our West Indies and the Mauritius will be, and indeed already is, that so much of the of the *continental* sugar-market as those colonies were wont to supply must be furnished from the cheaper labor of the foreign slave plantations; and of those supplies to the continent so failing from the British colonies the annual amount is, we repeat, from thirty-five to forty thousand tons. To this full extent, at all events, and under any possible remissions, we must prepare to see substituted, for the comparatively mild servitude of the British colonies, the oppressive slavery of the foreign settlements, fed by the African traffic; for East Indian sugar being, as official evidence has shown, by much too costly to compete on the continent with the slave-grown produce of the foreign settlements, the case as far as concerns the *continental* supply, seems wholly incapable of the remedy. Still, while we pretend not to deny that the English measure of emancipation is attended with the disadvantage of making room for a great deal of slave-grown sugar, on the continent, let us not be understood as thence inferring any blame to our country. At worst, she may have been a little too precipitate in a right course. Her first duty was felt to be her own reformation; and if that reformation has left a wider scope for the covetousness and cruelty of her neighbors, England, however she may lament the misfortune, at least does not share in the crime.

But though she be thus irresponsible as to the supply which she is enabling the foreign slave-colonies to export in her stead to the continent, her responsibility for her own home-consumption is clear and unqualified. If, on any pretext whatever, political or commercial, whether to help her revenue or to cheapen her purchases, Great Britain admit into her own market a single ton of sugar raised by a slave-importing colony, she is a direct receiver in the felony, with more than the felon's guilt. There will then be renewed, *for her profit*, at Puerto Rico or Bahia, the suffering which will have been vainly extinguished in Demerara and Barbadoes; and on her, therefore, will lie again that load of injustice from which she has so lately and painfully been shriven. We are far from understating the case—the suffering of our negro slaves had come, long before the Emancipation Act passed, to be a mere name, in comparison with what is likely to be substituted for it as the object of our patronage and protection.

Most plainly, unless some honest and firm interposition come speedily to the aid of our own West Indian negro, these flagrant results are but too much to be dreaded, from the necessary tendency of emancipation to produce one or other of two effects—either a great augmentation in the cost of production—or an abandonment of cultivation, not merely to the limited extent of the continental consumption, before mentioned, but generally throughout all the estates of secondary quality; that is, throughout more than half the British plantations. The average annual expense of each negro, including the cost of his dwelling and provision grounds, may be taken to have been, before the emancipation, about £6 sterling per head; so that an estate possessing 300 negroes, and producing 3300 cwts. of sugar, would have required, in the item of negro labor, a yearly outlay of about £1800, or 11s. in the price of the cwt. Even on the assumption, which we here adopt—but which is still denied by the West Indians—(and very streneously are they supported in their view by the *evidence* of Mr. Innes)—*viz.* that wages will eventually induce the generally of the negroes to voluntary labor—it is certainly not to be expected that the wages for the daily number of hours requisite to keep up the production, can average less than a further annual sum of £5 sterling per head. This will add £1500 to the whole cost; being at the rate of 9s. and a fraction, in addition to the former 11s. for each cwt. of the 3300; so that, both during, and after the expiration of, the apprenticeship, the labor, if attainable at all, will be found, even on this calculation, (which is below ninepence a day for each negro on an average of age, sex, health, and strength,) to cost at least £1 per cwt. of sugar, whereof somewhat more than 9s. is a new charge, occasioned by the emancipation.

But sugar, in this country, has become one of the necessaries of life; it has been rendered almost indispensable, even among the poorest classes, by their extensive consumption of tea and coffee. The admission of East Indian sugar, at a duty reduced from its present amount of 32s. per cwt. to 24s., which latter is the amount of duty paid on the sugar of the West Indies—even if such an equalization unaccompanied by any countervailing relief to the West Indians from their present commercial disadvantages under the Navigation Acts, were warrantable in point of justice to the present sugar-growers of the West—would still give no abatement of price; because East Indian sugar (as we shall presently see) may, from all past experience, be expected, if sent hither in any considerable quantity, to require, though at an equalized duty, a price rather above, than below, the sugar of the west, even with the calculated addition of 9s. per cwt. for free labor: the advantages enjoyed by the East Indian in cheapness of labor and other items of his outlay, being overbalanced by the heavier rates of his inland carriage and long voyage to England. Now, as England consumes almost 200,000 tons, or 4,000,000 cwts. of West Indian sugar yearly, an advance on that sugar of 9s. per. cwt. (the estimated additional cost of free labor) would be a tax of nearly £2,000,000 sterling, levied principally upon the working classes of our own people; and and yet, the duties and commercial restrictions remaining as now, it would be an advance altogether avoidable.

Perhaps it would be too romantic to expect that a mere philanthropic consideration for the remote sufferings of the African would lead the majority of the lower ranks in England to acquiesce in the payment of this heavy charge, still less in the surrender or abridgment of one of their most important daily comforts. The rise of prices, to so great an amount, and on so necessary an article, could not, in fact, fail to excite a loud and general demand for cheaper sugar; and since the *British* possessions would be incapable of satisfying this demand, it could be quieted only by the hasty removal of those prohibitory duties which now virtually exclude the sugars of the *foreign*, that is, slave-importing, colonies. With the diminished force and influence which modern events have left to the government, and especially with the present disposition toward free trade of all kinds, such a cry, however vicious, would not be easily resisted, even if the administration were interested in the resistence; but unfortunately, their interests would be with, and not against, such a movement; for it would help them in that great difficulty of all administrations, their finance. The diminution of consumption, compelled by the rise of prices, would have occasioned a grievous deficiency in the revenue produced by the sugar duties: for instance, a diminution. of one-fifth would leave a deficiency of near £1,000,000 sterling. But the income so lost to the Exchequer would be but too easily reparable, by the admission of the foreign slave-grown sugars at a low rate of duty; and that would be a sufficient temptation, with most governments, to admit them.

Thus, by the simplest and most natural combination of popular clamor with the interest of the treasury, the whole object of our long struggle on the negroes' behalf is in danger of being frustrated absolutely and for ever. The evil of slavery, expelled from our colonies, will have shifted its sphere, indeed, but increased its amount. Not merely that sixth which has hitherto supplied the continental market—but half—perhaps, two-thirds —of all our West Indian possessions will have been thrown out of cultivation. From the commencement of that desolating change, until the burst of some such general emancipation as we have anticipated in the foreign colonies, the Brazillian and the Spaniard, not the African, will have been reaping the harvest of all our toil, and treasure, and sacrifice; and, in addition to her payment of £20,000,000 for the emancipation of British slaves, England will have sustained the mortification and mischief of depopulation to more than half her West Indian settlements—destruction to more than half her West Indian commerce—*and a frightful aggravation of slavery and the slave-trade.* The sum of human misery will have been augmented by the tremendous difference between the social condition of the British and of the foreign negro; the difference between cottagers, dwelling in enjoyment of all the necessaries and most of the privileges and comforts of life, alike in health or sickness, infancy or age—and men stabled like brutes, and harnessed out to the daily horrors of a toil, whose only redeeming quality is that of shortening the life which it renders intolerable.

Considerations of national defence, too, interpose themselves, though we hope they are not needed, to reinforce our humanity. Not only must the displacement of our sugar cultivation, by the foreign slave-trade, be the displacement likewise of all the maritime strength which the commerce and carriage of West Indian produce have raised and maintained for Great Britain, but the force thus lost by her is gained precisely by that power which alone has a navy capable of giving her moment's uneasiness. It is inevitably transferred to the already formidable harbors of the United States of America; for it is from their shores that the Spanish slave-islands derive their main supplies. Cuba alone takes goods from the United States to the yearly value of eight millions of dollars. Twenty years ago, the direct trade between the United State and the two great Spanish slave-colonies of Cuba and Puerto Rico would scarcely find employment for an amount of 50,000 or probably even 40,000 tons of shipping. That trade now occupies American shipping to the amount of 220,000 tons. To America, from her local position, the intercourse with Puerto Rico and Cuba is in the nature of a coasting trade; and thus, in the commencement of a maritime war, the Americans could man, without difficulty, from so vast a marine, a navy of twenty, or perhaps thirty sail, before the flag of an English admiral could be visible in their waters.

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Do what we may, however, the plain, disagreeable truth still is, that we can, in no possible mode, avoid a loss in some shape or other, to the extent of the difference in price between free and slave labor. We may distribute and apportion that loss; but we cannot get rid of it. We have for a vast number of years carried on a trade in sugar, in which we netted, by the labor of slaves, a profit of 9s. or 10s. per cwt. beyond what we could otherwise have attained. We have now, by a great national enactment, given up that profit. But having so given it up, we must patiently bear the privation, and not deceive ourselves into a supposition, that, by any arrangement or contrivance between one set of interests and another, we can—at least for a long time to come—retrieve a single penny of what we have fairly surrendered.

Yet perhaps eventually, even with a view to profit, the present maintenance of the West Indian plantations may prove itself a measure of no unproductive character. We have already pointed out the probability that our foreign rivals, from the new circumstances of the times, and most especially from the emancipation of the British slaves, will henceforth be more than ever exposed to those perils of insurrection and devastation by which St. Domingo was lost to France. We have shown how surely a successful revolt in any one quarter must be the signal for similar explosions in others; and by what cogent and not tardy causes the region and reign of slavery are likely to be narrowed. We hold it to be clear, at all events, that whenever any effectual check shall be given to the fresh importation of slaves, the foreign colonies, from the insufficient proportion of their female to their male negroes, and from their inexperience in those arts of amelioration by which the British planters have held their slave-population together, must rapidly lose that great command of cheap labor which at present enables them to strive so advantageously against England in the production of sugar. But if, while these defections are beginning to take place in the productive powers of neighboring colonies, those of Great Britain shall have been enabled, by the proposed remissions in aid of free labor, to maintain their extensive production at five-sixths, or even two-thirds, of its present amount, by negroes working for wages, our colonial industry must stand upon a basis more firm and lasting than slavery could ever have constructed.

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After the foregoing article was in type the following paragraphs have appeared in the newspapers, which are here annexed as the latest facts and evidence on the subject. Concise as are the statements, they confirm most of the positions assumed by the reviewer. Jamaica, and all the other British Islands, are rapidly and certainly moving on to that state to which Hayti has already arrived.

" *Abolitionism in Jamaica.*—The last accounts from Kingston, (to April 2d,) represent the affairs ot that Island to be in a suffering and fast decaying condition. The apprenticeship law seems to have utterly failed. The Jamaica papers speak in bitter and indignant terms of the present state of affairs. The sugar crop has decreased, crime and vice have increased, and the short-sighted philanthropists have added tenfold to the misery which they sought to alleviate. Free negro labor, in that climate, amounts to nothing. [New York Times.]

"It seems, notwithstanding the efforts of the British to suppress the slave trade, that the western coast of Africa, below the colonies, swarm with slavers. One vessel was recently taken, with a cargo of 600 human beings on board, and a few months ago, twenty-five sail of slave ships were lying at the port of St. Pauls."

QUERY AS TO MARL ON COTTON LAND. SINGULAR MODE OF HAY-MAKING.

Columbia, S. C., April 7, 1836.

To the Editor of the Farmers' Register.

It is a long time since I have written to you—but my long silence is not without a very good excuse, which would be uninteresting to you, or the readers of your interesting Register. As it is, I write to let you see that my regard for your periodical continues as great as ever, than to communicate to you matter of any worth. I learn, with great pleasure, from a friend in Charleston, that your Farmers' Register is now beginning to attract some attention; and, therefore, I hope the almost certainty of its usefulness, in the lower part of this State, may soon cause experiments to test the value of calcareous matters in that section of country that needs it so much, and has an abundance of materials for them. Have any experiments ever been made to test the usefulness of calcareous earth in the culture of cotton? The high price which this article bears at this time would render such experiments most valuable, and tend to show its great use in other articles of culture. Judging from analogy, I am satisfied that marl, or fossil shells, would much increase the cotton crops; for it is most probable that the great crops of cotton produced in Alabama are due chiefly to that ingredient in the soils of that State. Planters, in the tract of country where calcareous earth abounds, would very greatly promote their private interest, as well as that of their country generally, by making full experiments on this subject.

This letter, being desultory, very much like the mind of the writer, I shall now change the subject, and write on what I read may years since, in an European book, the name of which I cannot recollect. It is on hay-making, and I was struck at the time, with the plausibility of the author's notion.

He began, by asserting thatth ehay of young and tender grass is sweeter, and more nutritious than that made of grass that has been suffered to grow old and less succulent. I cannot ascertain, by my recollection, whether he merely suggested a view not tried before, or whether he had actually practiced the method of making hay which he proposed. What I say on the subject, will, of course, be taken only for what it is worth. His plan was to cut his grass as soon as it is high enough to be cut, to take it off the field at once, and spread it thinly on the floor of a large house, prepared for the purpose, by having its sides so open all round as to admit a free circulation of air. Hay cured in this manner, retained its green color, and its substance was not impaired in any degree by exposure to rain, dew, or the sun. By the time he had more grass fit to cut, that in the house was dry, and the new grass was deposited on the top by spreading it as before. The same operation was continued or repeated as long as grass could be obtained during the whole summer, without disturbing at all that which had been previously deposited in the house. The erecting a suitable building, need not be expensive, though it should be large; for it may be made in the coarsest manner by the farmer's own people. It appears to me that this manner of making hay has a great many advantages over the common mode. First, the hay must be better and more palatable for the horses and cattle. Secondly, it cannot require more, (if as much,) than half the work. Thirdly, the farmer can better select his own time for it, and his grass need never be exposed to rain, by which much of the hay made in the usual way is much injured, and sometimes totally spoiled. Much more might be said on this subject; but this is enough for the present, and if it be thought proper, it may be discussed more fully at a future time.

N. H.

[There are abundant proofs derived from experience, in Virginia, that marling is no less beneficial to cotton, than to other market crops: and besides, there is another important and a peculiar benefit to cotton, in this region. By the marling making the earth warmer, and the growth of the cotton plants more forward, the crop is matured earlier than one equally heavy, on land otherwise manured, and not calcareous; and thereby much good cotton is made from pods that would otherwise be caught unripe, by frost. This particular effect, however, would be of less importance in the warmer climate of South Carolina.]

From the Genesee Farmer.

RECOVERING FROSTED PLANTS.

It is well known that the injury caused to plants by early spring frosts, is not owing so much to the direct action of the cold, as to the sudden application of warmth afterwards. London nurserymen have availed themselves of the knowledge of this fact in recovering plants affected by frost during the night. Their practice is simply to sprinkle them copiously with cold water before sunrise. This produces the same effect as the application of cold water to a frozen limb—abstracting the frost so gradually as to produce no injury to the affected parts.

From the Genesee Farmer.

ROTATION OF GARDEN CROPS.

It is well known that nearly all cultivated crops exhaust the soil; and that most crops if continued in yearly succession on the same piece of ground, grow more feebly, degenerate, and become more subject to disease, unless the soil is constantly enriched by enormous quantities of manure, and even this is not always sufficient to prevent those evils. It is also well known that these difficulties are prevented with far less expense of manuring, by an alternation of different crops, by which plants of the same or similar nature are not cultivated in immediate successsion, but recur at as distant intervals in the course as circumstances will allow. Thus, in grain crops, the leaves being small, nearly all the nourishment goes to the formation of the seed; hence all plants, where seed is the principal product, should never succeed each other. But they may succeed, or be succeeded by, those plants whose principal product is leaves, as green crops of clover; also such plants as cabbage, and others of a similar kind. As plants exhaust that part only of the soil which comes in contact with the roots, a spindle root, such as a beet or a carrot, may draw abundance of nourishment from land, the surface of which has been exhausted by short or creeping roots. Again, crops consisting of plants whose mode of growth or cultivation tends to the production of weeds, should not immediately succeed each other. Hence hoed crops may follow those sown broadcast, as a means of preserving the land clean.

Rotation of crops is especially necessary in garden culture, because here the expenses of cultivation are considerable, and as the crops are generally heavy and valuable for the amount of land occupied, a greater difference results from good and bad management, than in common field culture.

The following course for garden rotation is given in M'Intosh's Practical Gardener:

1. Brocoli, cabbage, cauliflower, and savoys.
2. Common beans, French beans, and peas.
3. Carrots, beets, and parsnips.
4. Turnips, early potatoes, onions, leeks, &c.
5. Celery, endive, lettuce, &c.

The author of the above named work, further adds. "It is found in practice, that celery constitues an excellent preparation for asparagus, onions and cauliflowers.

"Turnips and potatoes are a good preparation for cabbages or greens.

"Brocoli or cabbages are a good preparation for beans or peas.

"Cauliflowers prepare well for onions, leeks, or turnips.

"Old asparagus land affords a good preparation for potatoes or carrots.

"Strawberry, currant, gooseberry, and raspberry, for the same.

"Turnips give a suitable preparation for celery or endive; and peas, well manured, are a good preparation for spinach, &c."

RESULT OF THE PETITION OF THE AGRICULTURAL CONVENTION.

The last session of the legislature of Virginia was not closed until when well advanced into its fourth month; and would not then have been ended, but for the near approach of the next elections of members—which is the only effective limit, and term of the duration of the sessions, which *now* exists. The petition of the Agricultural Convention for some legislative aid to the diffusion of the knowledge, and promotion of the interests of agriculture, was presented on January 14: was referred to the Committee of Agriculture and Manufactures, and ordered to be printed, (as usual with the most important papers,) *for the use of the members*—which, whether viewed as a compliment, or otherwise, the result has shown was a useless and worthless measure, and not deserving the very small expense required for the printing. Time passed away without any action, any consideration, or any manifestation of a desire to act upon, or to consider the petition, or its objects—and it soon became evident to its most zealous movers and advocates, that nothing would be done in accordance with its prayer. From our long established opinion of the character of the legislative procedure of Virginia—of the description of persons who have long guided or controlled it—of the means by which such dignities are usually gained—and of the kind of qualifications best suited to keep possession of them—for all these reasons, we had but faint hopes of any efficient and serviceable enactments for the advancement of agricultural knowledge—or indeed for the *practical* promotion of any of the great and important interests of the commonwealth. We were therefore in a great measure prepared for a final rejection of the petition of the Convention, after some *appearance* of deliberation thereon. We had even (in imagination) anticipated the kind of *reasoning* that would be used to oppose the general measure—and were prepared to hear of the ridicule and scoffing of every particular proposition that had been (or could be) made, for the advancement of agricultural improvement—and still more to hear the *economical* objections of members, who would not have hesitated to spend more public money than all that was required for a year's expense of a Board of Agriculture, in a contested election of a door-keeper of their hall. But we were *not prepared* for the actual course by which the expected result was reached. The petition was not *rejected*—for in truth it never was acted upon, considered, or its objects in any way discussed by the legislature—and almost as little may be said of the action of the Committee of Agriculture, to whose charge the petition had been referred. As late as five or six weeks after that reference, the committee had not taken the petition into consideration, and had taken no step whatever, with regard to it. Afterwards, at the request of its chairman, and aided by his interest and support, (and for which, however, ineffectually exerted, that gentleman deserves the thanks of the friends of the measure)—the Committee of Agriculture, took up the petition—but only to ask of the house, "to be discharged from its further consideration;" which was done, with the utmost readiness. This final dispositon of the petition attracted so little attention, that probably half the members of the legislature did not know of it being made—and it may be doubted whether they know of it yet.

If the most enlightened and patriotic legislature that Virginia has ever been blessed with, had, in good faith, and with the best intentions, undertaken the novel subject of aiding the improvement of agriculture, there would necessarily have been much diversity of opinion, and on that account, a probable want of final and proper action, during the first session. But the discussion of itself, would have done much good, and would have certainly led to future and beneficial action. With even this evidence of disposition to aid agriculture, and the prospect which it would have offered of future results, the friends of the cause might have been contented. Such certainly would have been our own view of the matter—and however anxious that *something* should be done to further the general object of the Convention, we would have preferred that there should have been *too little*, rather than *too much* action of the legislature; or that any particular measures should have been adopted, unless with due deliberation, and in the manner best calculated for permanency. If, at the last session, the legislature had extended (and limited) their action to simply instituting a Board of Agriculture—a mere consulting and advising body, of eight or ten members—which would not have cost annually more than $1000; and which institution, would not have pledged the legislature to any other special measure or action in future—we would have preferred that course to the adoption of all of the other recommendations of the Convention. This admission may perhaps, be thought to contradict our former expressions, or acts. But there is certainly a great difference between the advocating by a private individual, of general measures, or a system, for the adoption of government, and of hasty enactments designed to bring such general measures into operation. Of the value of the *end* in view, there is no question: but of the *means*, there may be much to doubt, and to fear—and the adoption of unsuitable means—though haste and want of due consideration, would greatly retard, instead of hastening the results desired.

But the mode in which the last legislature disposed of the petition of the Convention, furnished no ground to suppose that the objects of that paper, would have found favor under any circumstances. The course was precisely such as might have been expected, from a body that closed their long session by passing or rejecting bills almost *en masse*, and in the most indecent haste, after having spent two weeks, or more, in discussing abstract resolutions on the northern abolition movements—(a question on which the members professed to be all of one opinion—) and which resolutions, when finally passed, could not lead, and were never expected or designed to lead, to any practical, useful, or *direct* end whatever. They have been laid before Congress. Their existence is scarcely known to one abolitionist in a thousand—and on not one of them, nor on any one else, have the resolutions had the slightest effect. This is a peculiarly forcible, but yet true illustration of the general character of the legislative procedure of Virginia; and the existence and long continuance of that character, is the sorest of all the many evils under which the best interests of the commonwealth are suffering and sinking. The "anti-abolition resolutions" are particularized, not so much for the enormity of the case, as because they were in the uncommon position of not presenting a question of creed and conflict of political parties: and opinions on questions of the latter kind, will always be carefully avoided in this journal.

Such censures as we now utter, may perhaps apply with peculiar fitness to particular acts and times, or to particular bodies of men. But generally and correctly they apply, (and so we design them to apply,) to all times for twenty years back, or more—and to all parties, whether forming majorities or minorities in our legislature. We fear that it is the incurable vice of Virginia legislation to *talk*, and not to *act*—and that it will continue to be distinguished for its abundant fruits of long speeches upon abstract questions—and its utter neglect of useful and practical works. Because Madison, and Taylor, and Giles, and other intellectual giants of that time, by the discussion of resolutions in the Virginia legislature, effected a great political reformation—many, even of the pigmies among their successors, have aped the form of their example, and tried by mere "resolutions" upon almost every federal question of interest, to produce important results. The peculiar circumstances which existed in '98, the cause, and above all the *men* who acted—produced the results—and not the manner of action (by passing resolutions,) nor because the theatre was the House of Delegates. Yet an unhappy consequence of those glorious events has been to establish in the Virginia legislature a fashion of discussing and adopting series of resolutions at almost every session, on mere abstract questions, and in that way to waste the time of the assembly, and the treasure of the state—and to overlook and neglect all great practical interests. Yet all these feeble and ridiculous attempts to assume the port and dignity of the great original examplars, have resulted in nothing—unless to raise to some notoriety and temporary importance, and perhaps to higher political station, some of the busy movers and supporters of such "resolutions." The general result has been to degrade the character of our legislation, and to render it as ridiculous abroad, as it is inefficient at home.

These expressions of censure are directed to the general legislative course described, and not to any particular acts, or opinions, or to men who have sustained either. Our own individual and private opinions have in most cases, concurred with the various resolutions that have been at various times adopted in the legislature of Virginia—and in some of them, we had an humble participation, and lent to the measure a zealous and hearty support. But without regard to the purport of such resolutions, we protest against the entire course pursued with regard to them, and call on every true friend of the interests of Virginia, to declare war against all such discussions of unsubstantial abstractions—and to demand that the true practical interests of Virginia shall not continue always to be neglected, merely to indulge political aspirants and office-seekers in exhibiting their to supposed talents, and their claims to the rewards for which they offer resolutions, and make speeches thereon. The people, those who make legislators, must take this matter in hand, and insist that something shall be done for agriculture, instead of there being an almost regular waste of some weeks of every session, in discussing abstract resolutions—by which, what ought to be a dignified legislature, is converted into a mere debating society; and hundreds of thousands of dollars are spent, merely that Mr. A. or Mr. B. may show that he would cut a good figure in Congress, if the people of his district could be so impressed with his merits as to send him there.

Nevertheless—let the friends of agricultural interests not cease to exert every effort to promote the diffusion of agricultural knowledge, and that too by means of legislative aid. Let every one who is impressed with the value of the object, exert his influence at home to advance it, and the voice of the next Agricultural Convention may be heard, and its prayers not be so totally neglected as those of the last.

From Chaptal's Chemistry applied to Agriculture.

GENERAL VIEWS OF THE ATMOSPHERE, CONSIDERED IN ITS EFFECTS UPON VEGETATION.

In order to judge of the influence which the atmosphere exercises over vegetation, it is necessary to be acquainted with the peculiar and characteristic properties of each of the elements of which it is composed, and to study their action upon terrestrial bodies.

The gases, azote and oxygen, are the two fluids, of which the atmosphere is essentially composed; they are found in uniform proportions, even in the highest regions from which they have been brought. M. Gay-Lussac has established this fact, by a comparative analysis of the air taken from the height of twenty-three thousand feet, and of that which is upon the surface of the earth.

There are certain other fluids, which are uniformly found in the atmosphere, but in very variable proportions; the principal of these are carbonic acid, water, the electric and magnetic fluids, light, and heat. The two last mentioned, exercise a very marked influence, not only on vegetation, but on all the phenomena which terrestrial bodies present to our notice; and though they do not enter essentially into the composition of the atmosphere, their action is so closely united with that of its principal constituents, as to be nearly inseparable from them. In order that the action of the atmosphere may be better understood, I propose to to treat separately of all the fluids it contains, and afterwards to show the phenomena which the application of them to agriculture exhibits.

Of the Ponderable Fluids contained in the Atmosphere.

The ponderable fluids contained in the atmosphere are azote, oxygen, carbonic acid, and water.

1. Azote constitutes nearly four fifths of the atmospheric composition, and yet, by a singular caprice of nature, it exercises less influence on the substances of the three kingdoms, than any one of the other principles contained in the atmosphere. This gas is found in small quantities in some of the products of vegetables, and abundantly in those of animals. The presence of azote in some of the products of vegetation is to be accounted for by its presence in the water, which plants imbibe from the atmosphere, and in those manures by which plants are nourished, and of which it forms one of the principal constituents.

In animals, in which azote is more abundant than in plants, the food by which they are nourished, and the air which is inhaled by respiration, concur equally to account for its presence. The experiments of Messrs. de Humboldt and Provençal upon fish, Spallanzani upon reptiles, and those of Messrs. Davy, Pfaff, Enderson, Edwards, Dulong, &c. upon man, leave no doubt as to be absorption of azote during respiration; but this absorption is unequal and irregular, varying according to circumstances; this gas differing from oxygen in this particular, at least in its effects upon animal and vegetable economy. The action of azote is, so far as it is known, of such trivial importance, that we are at a loss to account for the proportion which nature has assigned it in the composition of the atmosphere. It is supposed by some, that all the gases, all the vapors, and all the exhalations which arise from the surface of the earth, form in the atmosphere an immense magazine of azote, which is returned thence as it is needed, either for the support of animal and vegetable life, or to produce those phenomena of composition and decomposition, which are constantly renewing the surface of the globe. The specific gravity of pure azote is to that of the atmosphere in the proportion of 9,691 to 10,000.

2. Oxygen gas forms about one-fifth of the atmosphere. The specific gravity of oxygen is to that of the atmosphere, as 11,036 to 10,000. The effects produced by oxygen are equally numerous and important; it supports animal life by respiration; and combining with the carbon of the blood, it produces the greatest proportion of animal heat. The germination of seeds is promoted by this gas, and it is absorbed by the leaves of plants during the night: by its combination with the metals the oxides of them are formed. It is likewise the necessary agent of combustion, and concurs powerfully in the decomposition of all animal, vegetable, and mineral substances.

In all cases where oxygen exerts its action, it combines with some one of the elements upon which it acts, forming acids with carbon, azote, sulphur, phosphorus, and many of the metals; water with hydrogen, &c. The nature of the compositions, of which oxygen is an element, varies according to the proportions in which it enters into combination.

When we survey the extent and importance of the operations performed by this gas, and especially when we consider that it is constantly forming new bodies, with which it afterwards ceases to have any connexion, we are almost led to fear, that the atmosphere must be, sooner or later exhausted of this active and regenerating principle; but nature, we find, is continually repairing the loss thus sustained, by the production of equivalent quantities. The leaves of plants, under the influence of the solar rays, pour forth into the atmosphere torrents of oxygen, produced by the decomposition of carbonic acid and of water; of which they appropriate to themselves the carbon and the hydrogen.

It is without doubt possible, that in many situations the reproduction of oxygen is not in proportion to its consumption. This must happen especially where great quantities are required for respiration, or to support combustion. But this deficiency is only partial and momentary; for the great mobility of the atmospheric fluid enables it, almost immediately, to restore its equilibrium from all points. The agitation of the wind mixes together, in proportions nearly constant, both the elements of which the atmosphere is composed, and the principal fluids which are found in it.

The creation or destruction of any element is not to be found in the operations of nature. The numerous phenomena of composition and decomposition, which take place upon the surface of the globe, present only changes of combinations, which are formed according to fixed, eternal, and unchangeable laws. Thus nature is regenerated, without being impoverished; and matter experiences only those changes which are reproduced uniformly and periodically, especially in organic bodies.

3. Carbonic acid is found constantly, but in various proportions, in the atmosphere. Though much heavier than azote or oxygen, its weight being to that of the latter, as 1,520 to 1,000, it is found disseminated throughout the whole atmospheric region. The elder M. de Saussure has, by means of lime-water, drawn it from the air upon the summit of Mont Blanc. From the results of all the experiments that have been made, there can be no doubt, that the proportions of azote and oxygen in the composition of the atmosphere are uniform and nearly invariable; and it appears to be likewise proved, that carbonic acid is also found there, and at all heights, but in various proportions.

M. Th. de Saussure has compared the different portions of carbonic acid in the atmosphere which he has analyzed, and found the difference between them, in summer and in winter, to be as follows.

In winter.

31st of January, 1809, 10,000 parts of air contained	- - carbonic acid	4,570
2d of February, 1811	- " "	4,660
7th of January, 1812	- " "	5,140

The mean term in winter from 10,000 parts of air was,

In volume	-	4,790
In weight	-	7,280

In summer.

20th of August 1810 10,000 parts of air contained	- - carbonic acid	7,790
27th of July, 1811	- " "	6,470
15th of July, 1815	- " "	7,130

The mean term in summer from 10,000 parts of air was,

In volume	-	7,130
In weight	-	10,830

Without doubt, when the air is tranquil, or when the carbonic acid, which is produced so abundantly by fermentation, respiration, combustion, &c., is retained in confined places, the quantity of this acid will exceed the ordinary proportion; but from the moment that the agitation of the winds can mingle it with the atmosphere, it is spread and diffused towards all points, according to certain fixed laws. Unless in some extraordinary cases, which form exceptions to the general rule, carbonic acid exists in the atmosphere at most only in the proportion of $\frac{1}{300}$.

Carbonic acid is constantly absorbed and decomposed by the leaves of plants. The carbon is appropriated by the plants to their own support, and the oxygen is thrown out into the atmosphere. Carbonic acid combines with the lime in fresh mortar, and causes it to return to its original state of lime-stone. Under the pressure of the atmosphere, water will hold in solution nearly its own volume of carbonic acid, and be slightly acidulated by it; but under the force of a greater pressure, it will contain a much greater quantity. Water, thus charged, froths like Champagne wine, which owes its effervescence to the carbonic acid produced by the fermentation of the wine in well-corked bottles. In some recent experiments carbonic acid gas has been reduced by compression to a liquid state.

4. Water exists in the atmosphere, under the form of an elastic fluid. When it is absorbed by bodies for which it has a strong affinity, such as the calcined muriate of lime, the portion of air from which it is taken, is diminished in weight

and volume. This has been proved by the experiments of the elder M. de Saussure and of Davy. The quantity of aqueous fluid contained in the air, varies according to the temperature of the atmosphere, and increases in proportion as that is elevated. At 50° Fahrenheit, it forms in volume nearly $\frac{1}{50}$ of the atmospheric fluid; and as its density is to that of the atmosphere in the proportion of 10 to 15, it constitutes nearly $\frac{1}{75}$ of its weight (Davy.)

The aqueous fluid forms, when the atmospheric temperature is 34° Centigrade = 93°.20, (Davy says at 100°.) $\frac{1}{14}$ of the volume of the air, and $\frac{1}{21}$ of its weight.

The elder M. de Saussure, in his beautiful *Treatise upon the Hygrometer*, has determined the weight of the water contained in a cubic foot of air, at different temperatures, and has prepared the following table of the results.

Degrees of hygrometer.	Weight of the water contained in a cubic foot of air at 66°.2 Fahrenheit.	Weight of the water contained in a cubic foot of air at 45°.9 Fahrenheit.
	Grains.	Grains.
10	0.4592	0.2545
20	1.0926	0.6349
30	1.7940	1.0833
40	2.5634	1.5317
50	3.4852	2.0947
60	4.6534	2.7159
70	6.3551	3.3731
80	8.0459	4.0733
90	9.7259	4.9198
98	11.0690	5.6549

"Consequently," adds M. de Saussure, "I do not think we are far from the truth, in assigning 11 grains of water to saturate a cubic foot of air, at the temperature of 15° of Réaumur," (equal to 65°.75 Fahrenheit.) "The solution of these 11 grains of water in a cubic foot of air at the temperature of 15° Réaum. (equal to 65°.75 F.) increased the density of the air so much, that the barometer, which before was at 27 inches, rose to 27 inches 5 lines 79,411, that is to say, about 27 inches 6 lines; consequently, the density of the air, or its volume in the receiver, was increased about $\frac{1}{54}$."

When the temperature of the air is diminished, the aqueous fluid is condensed, and appears in the atmosphere in the form of vapor, and is deposited in the state of dew. The moisture of the night air from this cause, during the heat of summer, restores vegetation from that state of languor produced by the too great warmth of the day.

Oxygen and azote have been classed among the simple bodies; carbonic acid and aqueous fluid among the compound bodies, of which the principal constituents are known, and which can be formed and decomposed at will.

100 parts of carbonic acid contain—	carbon	27.36
	oxygen	72.64
10 parts of water contain,	hydrogen	11.06
	oxygen	88.94

Oxygen and azote constitute, essentially, the atmosphere; since, when the two other principles are separated from it, it still retains nearly all its characters of form, elasticity, &c. It however loses its most important powers of influencing vegetation; so that all the substances found in the atmosphere are necessary to the production and renewal of the phenomena which the three kingdoms present to us.

Of the four principles of which I have just spoken, as constituting the atmosphere, the aqueous fluid is that which appears the least closely united to the others; since a change of temperature alone is sufficient to produce a change of its proportions; whilst azote, oxygen, and carbonic acid preserve, always, nearly the same relative proportions; nor can they be varied, or disunited, by means of compression or change of temperature. The aqueous fluid does not rise to a great height in the atmosphere; for, according to the reports of those experimentalists who have arrived at their conclusions by the assistance of air-balloons, the higher regions of the atmosphere are very dry, so as to produce, by the avidity with which they absorb the moisture from the boat of the balloon, a warping and cracking of its boards, as if they had been exposed to a strong heat. This effect is produced by the dryness of the atmosphere and the diminution of its specific gravity.

The manner in which the atmospheric elements are united is worthy of notice. This union is sufficiently strong to counterbalance the difference in their specific gravities, and not to allow them to be separated by compression, or the tumultuous agitation of the air; and yet it permits the various principles to be decomposed and isolated, by presenting to them bodies for which they have some slight affinity. Thus, if we inclose under a bell-glass any volume whatever of atmospheric air, the aqueous fluid may be extracted from it, by the calcined muriate of lime. The combustion of phosphorus in it will absorb the oxygen gas; lime-water, or the caustic alkalies, will combine with the carbonic acid; and nothing will remain but azote, which is the portion that has the least tendency to form combinations.

This weak state of union among the principles contained in the atmosphere is necessary, in order that they may exert their powerful and constant action upon all the various bodies which cover the surface of the globe; the composition and decomposition of which cannot be effected otherwise than by the means of these agents.

Independently of those bodies which essentially constitute the atmosphere, there are mingled in it the exhalations constantly arising from the earth; these are again disengaged from the air, and precipitated, as soon as the heat, or any other cause which occasioned their ascension, ceases to act upon them. These exhalations modify the properties of the air, and affect its purity. The oxygen and the water of the atmosphere become impregnated with the particles of the exhalations which are deposited with them upon the surfaces of other bodies, where they remain in contact, or enter into combination, with them. The origin and dissemination of many maladies may be traced to this source; the germ of them is carried through the air by the aqueous fluid. And for the same reason it is, that intermittent fevers are endemic in those situations where large quantities of animal or vegetable matter are undergoing decomposition, as upon the borders of ponds and marshes; and that miasm, which arises from numerous animal remains in a state of decomposition, becomes a fruitful source of disease. It is for the same reason also dangerous, under some circumstances, to breathe the evening air; the aqueous fluid contained in it, is loaded with the noxious principles, which the heat of the sun during the day had caused to ascend into the atmosphere. The disagreeable odor, conveyed to us in mists, is owing to the power of the aqueous fluid in transmitting the exhalations arising from the earth.

The manner in which the air conveys to us the perfume of plants, and the odor which it contracts from the exhalations of bodies in a state of decomposition, indicate clearly its influence in producing maladies, and still more plainly its power of propagating those that are contagious.

[To be continued.]

From the Boston Courier.

BROOM CORN CULTURE.

A broom corn mania is getting up in this region, and the coming spring, from appearances, little else will be seen in meadows. Broom brush is unexampled in price, selling readily at fifteen cents, and ashes to put on broom corn land, sell now at twenty-five cents per bushel in this village. The produce of an acre of broom corn was sold the other day in this town for $130.

THE MONEY MARKET.

To the Editor of the Farmers' Register.

"The expected increase of bank capital in this state will not be obtained this year. The legislature not having had time, during a session of three months, to act on this subject. This may tend to retard the improvements which are now in embryo. An advance in the price of the stock of the existing banks has resulted from this neglect, and 118 to 120 per cent. is now spoken of for Virginia and Farmer's Bank stocks. Petersburg Rail Road shares command 119—Greensville and Roanoke $8 or $9 advance on $35 paid. The subscription to the Raleigh and Gaston Road, which is reopened for a limited amount, is freely taken, and the work is commenced.

The cotton manufacturing establishments are in a thriving state. The stocks of those in Petersburg, which are now in operation, command 25 per cent. premium, or more. Their goods are in request in all the southern, and some of the northern markets."—*Com. Rep.*, *Far. Reg.*, *p.* 768.

Sir: Such is the view taken of the refusal of the legislature of Virginia to increase its banking capital, and such the result of the actual state of things, so inimitably described, and so encouragingly stated in the latter part of the first paragraph. Since they were written, Massachusetts and Maryland seem to have simultaneously thought and acted with Virginia; and will have all performed their duty to themselves, their contemporaries, and to posterity. Surely it will be but prudent to try the result of the $20,000,000 about to be thrown on the money market of Europe, before fully $30,000,000 more should be issued. An admirer, and as far as my influence has extended, a supporter of the Bank of the U. S., I will freely confess I dread the effect of their attempt to raise this money, by what is neither more nor less than a sale of stock in London, on the state of exchange; and in consequence of its reduction, on the staple articles of the country. It deprives them of their fair chances, as the means of paying the general debt of commerce and gives it to the holder of capital, too often fictitious: and should the money jobbers, in Europe, dreading the actual state of things, in the United States, not give a good price, or take but a portion, the effect of such a circumstance would be doubly disastrous on the value of all monied securities. Besides, when we read of such an attempt as that, seriously made, and which Congress must and assuredly will as steadily resist, to issue $200,000,000 of stock on the credit of the public lands, and for the purpose of raising a revenue on commerce to discharge the interest, it is enough to appal the stoutest heart. Why not repeal the duties, lessen the expenses of the Government, and depend on the land? The spirit of Law of Lauriston, must have arisen in the midst of us, and at a moment when convulsions of a dismal character are opening on our view, are we witnessing the "crowning" work which is, first to starve the laborer, and last, deceive and ruin the wealthy proprietor; for such will be the inevitable effect of a system, which confines the capital of the country to cities, and destroys the yeoman. A fine example of it is to be seen in South Carolina, where the superior attraction of capital in stock companies has concentrated it in Charleston, to the ruin of the great proportion of fine land around it. It will do more than this. The high price of provisions will enhance the value of labor, and in its turn, this will check the progress of manufacture, paralyze an immense capital, and throw the country into a full and perfect state of dependence on foreign nations. This very year a heavy *exportation* of specie will be required to pay for the necessaries of life to be *imported*, and if the issue of paper is to be as great as is threatened, its general effect on provisions, the value of labor, and on manufactures, must and will be indeed dreadfully disastrous. The instant repeal of the whole tariff, would not only be infinitely preferable, but perfectly efficacious. However, this is but prefatory. My object is to take a view of the situation of Virginia, and Maryland, and to propose a remedy, which shall preclude an enormous issue of paper, and still effect the designed object. This will be done by making a State Loan of, say $10,000,000, payable in, say 30, 40 or 50 years, instead of increasing the bank capital; as, in the one instance, calling for it as you want it, you know exactly for what purpose and how much you issue; and in the other, are no more masters of its amount and application, than you are of the wind. As to the vulgar notion of going into debt, it is pretty much the same in both cases; and hence, on that score, there need be little difficulty. My plan would be, if it was possible, that Maryland, Virginia, the Carolinas, and Georgia, should unite in borrowing as much as was wanted; and after proper surveys of the projected works had been made, they should either singly or together, complete them, and when completed, they should sell three-fifths, or four-fifths of them to the public in shares of $100 or $50 each, or, perhaps, they *might* pay such a revenue as to make them worth retention—the final disposition to be determined by events.

The credit of the different States on the London

Stock Exchange, is various. What that of Virginia is, I am ignorant; but, if she boldly resists the crazy scheme of increasing the banking capital, and precludes the consequent enormous issue of paper, I am convinced her 5 per cent. bonds would sell, as readily, if not more so, than those of New York, or even Pennsylvania—for I cannot but confess, that I fear the latter may rather exceed her due limits. Let the facts, as stated by X, be communicated to a loan jobber, and he will more readily lend his money to such a community, than to one that was going to bank with it; especially, as he would know its expenditure was to be confined to a measure improving the condition of the borrower in such a degree as to double his security, for such would inevitably be the case, if it is laid out in canals and rail roads.

By adopting a measure of this sort, you would prevent the possibility of your farmers mortgaging their estates in the great pawn shops, which are every where opening, in either an avowed or disavowed manner; and by the improvements you executed, you would effect the desirable object of increasing the real value of the land—thus conferring the double favor on the state, on the one hand, preventing the farmer from "being led into temptation and delivered unto evil;" and on the other, adding to the value of his property, and increasing those means of taxation to which you would be compelled to resort—but, increasing them in such a way, as that the then large amount should not be equal to the *former* lesser sum.

C.

From the Genesee Farmer.

MOUSE TRAP.

The following contrivance for catching mice will perhaps be new to most of our readers. Provide a large earthen pot, with a hole an inch or two in diameter in the bottom, (a large gardener's flower pot will do,) invert it on a board or flat smooth stone, and sink it in the ground ,until the bottom of the pot is about level with the surface. Suspend, about two inches below the hole, by means of wire, a smooth wooden roller, which should be capable of turning freely on its axis. The surface about it may be sprinkled with chaff or short straw, and grain or seeds, and the roller be besmeared with lard and other attractive substances. Upon this roller the mouse leaps, and it immediately turns by his weight, and precipitates him to the bottom, from whence he cannot escape, as it is impossible for him to climb the sides. Many may be caught in the same trap without the trouble of re-setting. By burying the pot in mellow earth or sand it is easily taken up and replaced. This method is particularly adapted to catching mice in gardens, cellars, &c.

From the Norfolk Herald.

HERRING FISHERY OF NORTH CAROLINA.

We learn that the fisheries on Albemarle Sound, which at the commencement of the season were more unpromising than usual, are now completely overrun by the herrings, which suddenly made a rush down the rivers in such immense numbers, that in some cases large quantities caught were left to spoil for want of salt to pack them with; and we have been assured that in one or two instances the proprietors of fisheries, being unprovided with a sufficient supply of salt, have preferred lifting their seines and giving the fish a free passage, rather than haul them ashore.

From Loudon's Gardener's Magazine.

REMOVING SHRUBS FROM RENTED GARDENS.

At the last York assizes, an action was brought against a party for removing shrubs, &c. from a garden he had recently occupied; and a verdict under the judge's direction, was given against him. The judge laid it down as law, in the nineteenth century, that shrubs, when once planted, "became part of the freehold; and, therefore, could not be removed." Would you admit the discussion of this point, not legally, but morally, into your Magazine? It is, in the present state of the country where there exist so many tenancies, during which immense improvements are made in gardens, a very important one. I deny that this is law, because I deny that the trees are part of the freehold; for, if they are, then are carrots, thistles, and, much more, docks, also part of the freehold, and ought not to be removed. But, if it is law, it is fit that all parties knew it, that, if dissatisfied, they may set about getting it altered.

From the Genesee Farmer.

TO DESTROY ST. JOHNSWORT.

Mr. Tucker—I noticed in the Genesee Farmer of the 27th February, inquiries how to destroy that troublesome weed, St. Johnswort. Till your land well, seed thick with clover and timothy, and plaster. In case your seed partially fails, pasture close the first season—even sheep may eat the weed when young and tender, without any injury to them.

L. T.

East Bloomfield, April 7, 1836.

From the Genesee Farmer.

TO PRESERVE CORN FOR BOILING.

Extract of a letter from a subscriber in Canada: —"Travelling through the country the early part of this month, I was surprised at eating green corn; but on recollection, I had seen several methods of preserving it for winter use in your Farmer. On asking the lady of the house, her method seemed to be far different from any you have stated. I beg to introduce its simple way to you. Pluck the corn when fit for eating, strip down the husk so as to remove the silk' and then replace it—pack it away in a barrel, and pour on strong pickle, such as used for meat, with a weight to keep it down, and you will have a good sea stock—parboiled and then boiled to make it perfectly fresh and sweet as when taken from the stalk."

From the Journal of Commerce.

COTTON AND THE COTTON TRADE.

The report of the Secretary of the Treasury on this subject made 4th March last, by order of Congress, is a document of much value and importance, and contains a variety of tables relating to the growth and manufacture of cotton in all parts of the world. The first export of cotton from the United States appears to have been in 1785, 5 bags, and in 1786, 6 bags. As late as 1794, Mr Jay, when making a treaty with England was not aware that any cotton was exported from the United States. From that time to the present, the culture has increased, until our crops are now over 1,300,000 bales a year.

From this report it also appears that the import of cotton goods from India to England has ceased, and that the export of them from England has increased with astonishing rapidity.

When the East India Company's monopoly of all the trade of India ceased in 1815, the first private merchant ship that sailed from England for India, was the ship John Gladstone, belonging to Mr. John Gladstone of Liverpool. This event was much spoken of in the papers at that time, as opening a new era in commerce. It now appears that the export of cotton goods alone, from England to India, is over ten millions of dollars annually, being more than their export of cotton goods to the United States, which is about eight millions of dollars. But now that the East India Company's monopoly was last year put an end to in China, as well as in India, a vastly greater field is open in that quarter for English cotton goods, which will in consequence, increase in an equal ratio the consumption of American cotton in England, quite as fast as we are able to increase our supplies.

From Low's Elements of Agriculture.

MILLET.

Under the term millet are comprehended certain plants of different genera which are cultivated for their seeds:—

1. Panicum miliaceum—Common Millet.
2. Setaria italica—Italian Setaria.
3. Setaria germanica—German Setaria.
4. Sorghum vulgar—Indian Millet.

Common millet grows several feet high, and is terminated by a large branched panicle hanging to one side. It is very prolific in seeds. These are small and smooth; in some sorts brown, and in others yellow. The plant is cultivated extensively in Russia, in Italy, and Germany. Its seeds, being divested of their outer covering, are used in the manner of rice, and furnish a nourishing and grateful food. They are also made into bread, which, however, is not esteemed. They are used for the feeding of domestic fowls, for which they are well suited. The straw produced is bulky and valued for provender.

The cultivation of common millet is not practised in this country. It is not with us a part of the food of the people, while with respect to the feeding of domestic fowls, we have so many resources in the waste of our cereal grains, that there is scarcely need of cultivating any plant expressly for the purpose. But more than this, millet is not well suited to the colder parts of Europe, and supplies of it can be obtained in unlimited abundance from the shores of the Mediterranean.

The Italian setaria, cultivated in the south of Europe, is only known to us in this country as a plant of the garden. It is too delicate for the northern parts of Europe: for even about Bordeaux it is a precarious crop, suffering frequently from the effects of frost.

German setaria is cultivated in Hungary in fertile subhumid soils. It is used in its green state, or as dried fodder for horses and oxen.

The Indian millet furnishes bread to the Arabians and other people of the East. The flour is known to the Arabs under the name of dourra; and it is truly the bread-corn of Africa, being grown over all the parts of that vast continent. It is cultivated likewise in Italy and the south of Germany; and it was long ago introduced into Spain, it may be supposed by the Moors, if not at an earlier period still by the Carthaginians. It has been introduced also into the islands of the West Indies under the name of Guinea corn and into the Southern United States of America.

This fine plant grows with a strong reedy stem with broad leaves like those of the maize, but smaller, and producing a large panicle. Its seeds are smooth and roundish, resembling those of the common millet, but larger. They are ground into flour, but the bread made of it is dark in colour and coarse. In Europe the grain is chiefly used for feeding domestic fowls and pigeons, for which it is well suited.

This plant is the native of a warmer country and demands a more genial climate than we possess. With us it will scarcely even ripen its seeds, and frequently not even expand its flowers. Other species of Sorghum are likewise cultivated, but the same remark applies with more or less force to them all.

COMMERCIAL REPORT.

The active business which was done in domestic produce previous to the present month, has not continued, and the prices of the most important articles have declined, though they still continue high enough amply to repay the labor of producing them.

The price of tobacco has fallen $1 to $1 50 per cwt., and sales range from 5 to $10, not including fancy qualities. Accounts from the European markets are generally unfavorable, and the season for shipment has not arrived. Cotton has also declined about a cent, and may be quoted 15½ to 17½ cents, (in Petersburg,) with little disposition evinced on the part either of buyers or sellers to let the article change hands. The advices from Europe are favorable, but prices in this country had anticipated more than all the advance that has yet taken place there; about 70,000 bales more have been brought to market than at the same time, in 1835.

Flour is dull, at $6 75 per barrel for country brands; but the stock in Virginia is unusually small. Large supplies from the west are arriving in the northern cities, since the opening of the rivers and canals, and the foreign demand is very limited, being confined to the West Indies and South America. Importations of wheat, rye, oats, and barley to a considerable extent have been made at New York, from England, and the continent of Europe—a circumstance unprecedented in our commercial annals.

Indian corn commands $4 per barrel, (or 80 cents per bushel,) which is a high price when the abundance of the last crop is considered; and bacon is also very high, being worth 13 to 13½ cts. per pound.

A severe pressure for money has prevailed in the large commercial cities generally, and two per cent. per month was readily obtained for the use of it. Exchange on England fell to 5½ per cent., and stocks of almost every description declined in the northern cities materially. This pressure is ascribed to various causes, and among them may be enumerated the large amount of property destroyed by the fire in New York, and the heavy investments required to rebuild houses, and to replace the goods destroyed; the great accumulation of surplus funds in the National Treasury, or its depositories, amounting to thirty-five millions of dollars; the substitution of cash payments or short credits for the long credits formerly allowed on duties on importation; the vast sums invested in public lands, in city lots and works of internal improvement; the protracted length of the winter, which prevented an immense quantity of produce being brought to market at the usual time, and of supplies of goods being sent to the interior; the winding up of the branches of the United States' Bank, and the cautious policy necessary to be observed by that bank and other institutions, from the apprehension of government influence being used to the annoyance of the former; the interruption of supplies of specie from Mexico, in consequence of the revolution in Texas; the demand for specie to be sent to Cuba, and other islands, for the purchase of sugar and coffee, and to the British West Indies for the purchase of bills of exchange at a very low rate, being the indemnity paid by the government under the Emancipation Act; and to conclude, the many temptations for investments, offering a prospect of profitable results, in the wide scope presented by the rapid developements of the vast resources of our country. Inland exchanges are deranged, and remittances cannot be made with facility, nor at par.

Articles of foreign produce and manufacture generally command high prices. Sugar, particularly, has advanced beyond any former rate in time of peace; and this may be ascribed to the diminished cultivation in the British West Indies, under the free labor system, and to the failure of the crop in Louisiana. Coffee, now free of duty, bears as high a price as it did when taxed with two and a half cents per pound. Teas have not declined in any proportion to the amount of duty from which they are relieved. The immense demand for iron, has raised the price of that article in England nearly 100 per cent.

The stock for a rail-road from Richmond to Petersburg was filled during the past week, and nearly double the amount required was subscribed. The formation of this work, and of others now in progress, will complete the line from the Potomac to Raleigh.

X.

May 1, 1836.

STATEMENTS OF PRACTICE IN TILLAGE AND IMPROVEMENT, ON RAPPAHANNOCK LANDS.

To the Editor of the Farmers' Register.

Feeling as I do the inadequacy of my annual pittances to the discharge of the debt contracted to yourself, and the useful and zealous collaborators of your Register, a sense of justice prompts me to consider whether a life of 20 years, devoted with such assiduity as circumstances have permitted, to agriculture, might not furnish some gleanings worthy of lessening its obligation. A mind "desultory, studious of change, and fond of novelty," and impressed with distaste or disgust for systems which, from their history and developements, seemed to promise results meagre and stationary, if not retrogressive, frequently urged me in the very outset of my career, far from the beaten track, into others, which the want of an enlightened judgment caused me to pursue to my frequent discomfiture and loss. Such being in the main the mortifying results of my experimental wanderings, the offspring of a too eager and indiscriminating credulity in their inception, and perhaps, in their issue, of want of care in their execution, it was but too natural that I should settle down into the opposite extreme of scepticism, and to regard as impracticable, that which my bad practice alone perhaps had failed to attest. Indeed, Mr. Editor, the extreme paucity of precise results to which my most carefully conducted experiments have led me, has tended to a confirmed distrust of those which are every day announced as results of the experiments of one farmer, and contradicted by those of another, said to be similarly made. And why? Because I am satisfied from personal knowledge, that my own history is pretty much that of the whole class of gentlemen farmers in Virginia, and that nine times out of ten, experiments are made either under some prejudice, or that owing to the neglect or absence of the proprietor, they are abandoned in perhaps their most important stages, to the carelessness of overseers and slaves, leaving room for nothing but vague conjecture at last. And thus, Mr. Editor, are we still, and for a long time to continue, I fear, at sea, in regard to many of the most important principles and practices of our neglected and abused profession, unless, indeed, we hasten to profit by the obvious and the only remedy, so ably enforced by the patriotic president of the late Agricultural Convention, viz. an agricultural professorship in connection with an experimental farm at our University. Then, indeed, may we expect to see, the mists of uncertainty which now envelope the arcana of our science, flee before the torch of experimental knowledge, and our agriculturalists no longer groping in the dark, boldly advancing with an assured step to its richest rewards.

Shrinking with instinctive reluctance from a minuter record of my failures, with whatever denial of amusement or instruction to your readers, I proceed briefly to sketch such of my agricultural operations as may seem to have a chance of affording any portion of the latter. The subject of them consists of 2,000 acres, of which about 250 acres being chiefly a light, sandy soil, from 6 to 8 inches deep, has been cultivated in 3 fields, in corn, followed by wheat, and the hoof entirely excluded. The balance contains about 400 acres of flat, of about the same average quality, though a portion of it, say 50 acres, is a very light, poor sand, and perhaps, as much more is a deep sandy loam of a superior quality; about 100 acres of swamp land, subject to frequent overflows, and seldom producing from that cause half a crop, with about 200 acres of cultivated hills, some of them precipitous and poor, the balance being hilly, forms a standing pasture. The latter tract, with the exception of the swamp, was for 8 years in 4 fields, during which time it was moderately grazed, seldom commencing earlier than August, on the field to be broken for corn. I think the average product of both parcels might have been 4 barrels of corn, and not more than 6 bushels of wheat, in the last years perhaps 8 bushels. The only source of manure, until 5 years past, consisted of the offal of the corn and wheat, of which both farms shared equally, carried out in the crude state in the spring, upon the corn land. Clover was repeatedly sown upon such portions as were stiff and wet enough to produce it, but generally failed, or afforded but a scant cover.

At the end of the 8 years above mentioned, I was quite at a loss to decide upon the relative quantum of improvement in the two farms; the increase of crops on either, taken as the criterion, scarcely increasing it in any appreciable degree, either positively or relatively. The successful example of Col. J. Taylor, of Caroline, however, had strongly wedded me to the 4 field system, and it was abandoned not without reluctance, in consequence of the heterogeneous character of my land, having hills, flats, and swamps interspersed; the first and last of which imposed a heavy tax in the shape of shrubbing and ditching, when suffered to lie out so long. On resorting to the 3 fields, however, 50 acres of my swamp was laid down in herds grass and timothy, whilst the whole of it has been completely reclaimed by straightening a narrow crooked run, according to the method pointed out in the Register, and thereby adding largely to my crop, especially of corn, whilst that portion of the hills, which had been newly cleared of a considerable number of locusts, and whose sprouts required a heavy amount of labor as often as cultivated, have been laid down in highland meadow, oat and orchard grass and the locust sprouts trimmed up and suffered to occupy the ground, which, in groves of many thousands of considerable size, they now embellish and fertilize—forming, a most important adjunct to my standing pasture. One of them near my house, of about 10 acres, thus treated, which, in addition to the locust, was more infested than any piece of ground I ever saw with that pest, the sassafras, has had them entirely eradicated by grazing. A little salt occasionally sprinkled upon them, has probably expedited it by attracting the cattle. To these abridgments of labor heretofore required, has been added the expunction from my cultivated area of perhaps 100 acres of poor land heretofore cultivated: as much is [cultivated] on most farms in the neighborhood without any profit.

Additional savings have been made in the construction of my fences, consisting for the most part of a cedar watling, scarcely 18 inches high, placed upon a good ditch bank, and inclined outwards to keep off the cattle, and in the cultivation of my corn with the least possible degree of hoe labor.

The experience of more than eleven years having satisfied me that little was to be hoped from mere rest for soils, like ours, too light for clover, and aided only by the offal from its grain crops; I, therefore, immediately set to work to find subjects upon which to employ the labor saved, as above stated, for its improvement. Previous to this, a variety of green crops had been tried as substitutes for clover to be turned in as manure. Rye, buckwheat, cow peas, and Indian corn (sown broad cast early in June, and rolled down and ploughed in as soon as it began to wither in the month of September,) have in the order in which they occur, produced visible effects, but certainly in no degree corresponding with what I had been led to expect, particularly in regard to the peas and buckwheat, from the statements of others; and I consider these practices as only recommendable where it is desirable to remove and plough in manure, to avoid waste. About 4 acres thus sown on my light land, slightly manured the 1st June, 1834, was rolled down, ploughed and sown in rye the 1st of September. This was listed upon the 1st of April, and corn planted, the middles remaining unbroken till come time in May, or until the rye was in head, when it was turned in. The corn, as might have been expected, was not benefited, though the crop of wheat now upon it, evidently shows that the land is. I think that the corn, if cut for provender, would have yielded a greater bulk than any crop of hay I ever saw, and the practice would prove valuable, where there is a scarcity of that article. But to return from my digression: I had seen, for the first time in my life, the effects of marl strikingly exhibited on cotton, on the farm of Mr. F. W. Taliaferro, 8 miles below Fredericksburg, about 10 years ago, and having noticed shells occurring in their strata on the bank of the river (Rappahannock) I made my first essay with it upon a cotton patch of a few acres. The cotton was quite a failure: the succeeding crops of corn and wheat exhibited no improvement, and I gave it up in despair. The clover, however, which was sown upon the wheat, strikingly displayed its hidden virtues, and satisfied me as to its value. To work I went then seriously, for the first time, (6 years ago,) and taking advantages of a low tide, with the aid of scoops (or scrapers) and all my force of hoes, succeeded before its rise in scraping off the sand to the depth of about 18 inches, from (as I judge) more than the sixteenth part of an acre, thus denuding the marl for that space; and in throwing up a sufficient bank, afterwards faced with plank, to resist the tide. Two ox carts, two tumbrils, and the two scoops, continued steadily at work about a fortnight until we got about 10 feet below the surface, the marl becoming richer at every furrow of the plough (the only implement used in my pits from that time to the present,) when, to my great vexation, an infernal muskrat inundated my pit, and put an end to my labors, where, for want of a pump to drain it, they have not been renewed. In the mean time, however, the scoops, (such as are used on turnpikes, and to which there is nothing equal for the purpose,) had extracted as much as the 4 carts could haul out in a month, and to sufficiently marl about 40 acres, at the rate of 500 bushels to the acre. With the aid of a borer I have since found marl of the same description in three sites on my farm, and have employed all my leisure time in hauling it out, though owing to frequent long absences from home, and various interruptions, it has not been as rigorously prosecuted as I could have wished, the whole surface marled not much exceeding 100 acres. It is a poor blue marl, with a proportion of small shells, not exceeding, at most, 15 per cent.

and unless exposed to a winter's frost before turned in, would remain in lumps for years. My present practice is to put it on the young clover in the fall, and suffer it to remain in small heaps until the spring following.

My system of manuring too, both in its preparation and application for the last 6 years, has been materially changed. Several experiments were instituted with the view of ascertaining the comparative merits of ploughing in manure with the crops of corn and wheat, and leaving it scattered on the surface of the latter. Acres manured in these modes, have been staked off, and the produce designed to be measured; but owing to causes above hinted at, the results prove nothing with precision, and only leave upon my mind an impression in favor of surface manuring. On what even is the most unfavorable soil, it insures a crop of clover, whilst on young clover it doubles its value, and in no mode adds so much to the improvement of a light soil. The manure made in my stables and farmyards, is, during the fall, and winter, and spring, carried out upon whichever crop happens to be most convenient, whilst that which has been spread upon the clover receives a dressing of marl. Owing to a press of other work, the marl which was carried out upon about 30 acres of clover last fall, with the exception of a small quantity scattered upon a portion of the manured land, remains in piles, and the clover upon that portion is distinguishable from where I now write, at the distance of half a mile.

Instead of wasting my manure as I did for many years, and indeed until lately upon poor and sandy land, I never apply it now to any, which, with its aid, will not produce clover, unless, indeed, it happens to be convenient to marl, or a great "eye-sore." My crops of hay, which have been abundant, have, of course, added considerably both to the quantity and quality of my manure, which chiefly applied as a light top-dressing in the above-mentioned modes, has annually sufficed for about 30 acres, for the last five or six years, and has extended the clover to a corresponding degree, and I am encourged to hope that a few years more will afford a complete vesture to all my fields, with the exception of a few intractable spots. I regard my marl, poor as it is, as the chief hand-maiden of my improvements, and as the guardian of my manure, with which it shall ever go hand in hand.

Before I quit the subject, I would strongly recommend, on the score of economy, in all cases where the superincumbent earth is not too deep, the denudation of a sufficient area to admit of the use of the plough, and scoop, which implement, worked by two good mules, will, from a depth of 10 feet, and at an angle of even 45°, extract from a pit a mass incredible to one who has not tried it. The inconvenience resulting from an accumulation of water is thereby avoided, the marl is dryer and lighter, the carts are more expeditiously loaded, and the ascent from the pit being avoided, can carry much more.

I think it is about eight years since the termination of the comparative experiment of the systems of three and four shifts, the different results of which I have stated, so far as product enabled me to judge, as stationary or null; and I have stated, in a loose way, I believe all, or nearly so, the elements which have entered into any subsequent improvement, to ascertain which, we will now take the crops as a common measure for the two periods. Previously to the above-mentioned period, the crop of corn, as nearly as I can now ascertain, averaged between 800 and 900 barrels; the wheat crop, I am sure, I do not underrate, at 1000 to 1200 bushels. The rate of progression I cannot ascertain, but the crops of the two last years have been 1200 and 1400 barrels. The wheat crop has hardly increased in an equal ratio, and is too uncertain with us to form any basis for calculation. This, compared with what others have done upon a more propitious soil, would seem to be a meagre result, from the prosecution. for twenty years, of what are considered improving systems; for I am inclined to fear that in the apparent reference of the whole result to the latter period, I have given it credit for some accumulated but dormant capacity created, though scarcely exhibited during the former. The truth is, that any improvement of soils, light and poor, in its first stages, must, without extraordinary means, be imperceptibly and discouragingly slow; nor does discouragement give place to hope, until having crept to the first stage, with an agreeable surprise, we find ourselves prepared to advance almost *per saltus*. It is indeed the "first step which costs." Poverty must be drugged until she gets upon her legs, after which the *vis medicatrix naturæ* will carry her onward to fertility.

I have thus, Mr. Editor, though not briefly, I fear obscurely, proposed to the members of our communion, my humble experience, though without presumiug thereupon to ask the honor of baptism. Indeed, I have no higher aspiration than to be able at some day, worthily to share it with them, when, with a pride not less than that which elated a brother painter, when, on beholding the Transfiguration of Raphael, he exclaimed, "I too am a painter." I might with truth say, "I too am a farmer." In the meantime, you will excuse me for borrowing from an old favorite, the paragon of his species, "who, true to all beside, to it alone was false," his name.

OLD TYRO.

P. S. In looking over the foregoing hasty sketch, I discovered that, in the enumeration of elements of improvement, I have pretermitted the regular use of clover and plaster, the most important of all, and no less so, (for to its use, I chiefly ascribe my late success,) the use of the harrow, after sowing—a process a little startling in appearance, but beneficial even to the wheat, and vital to the clover, especially in sandy land, which cracks little with frost. After sowing a light field, in February, 1833, a hot spell of weather prevented the use of the harrow, until the clover had sprouted, all of which was killed by a spell of severe weather. Finding, on examination, a considerable portion of seed still lying unsprouted on the surface, the use of the harrow gave me a very tolerable stand. I have tried it in the fall; the first time, though much killed out by the unusual severity of the winter, yet I think the increased vigor of what remained, made amends for what was lost. Some which was sown the middle of last August on a hill-side, with a southern exposure, on rye, look decidedly better than any which I have ever had at this season.

From the Hampshire Gazette.

RECEIPT FOR MAKING COLD SOAP.

The leach tub or hogshead must be covered at the bottom with straw and sticks—then put in a bushel of ashes, then two or three quarts of unslaked lime, upon which you must throw two quarts of boiling water to excite fermentation and slake the lime; put in another bushel of ashes and as much more lime and water, and continue to do so until your vessel is full; put in hot water till you can draw off the lye, after which the heat of the water is not of much consequence. You must have, at least two thirds of a bushel of lime to a hogshead, if you wish your soap to be made quick; one hogshead of ashes will make two barrels of soap. When you draw off your lye, you must keep your first two pailfuls by themselves, and the next two in another vessel, and the third two in another vessel still: then weigh 29 pounds of clear strained grease, or of scraps, without straining, 32 pounds, put into a kettle with three pounds of rosin; then pour over it one pailful of lye from the first drawn vessel, and one from the second drawn vessel; put it over the fire, and let it boil twenty minutes—be particular to add no lye over the fire, but swing off the crane if it is in danger of boiling over; put it into your barrel, and add one pailful of lye from the third drawn vessel, and give it a thorough stirring; then weigh your grease for another barrel and take the lye remaining in the vessels, in the same manner as for the first barrel; then draw off your weak lye, and fill up the vessels as fast as possible, remembering to put half to each barrel, that they may be equally strong. If your leach run through fast, you may have your barrels full in an hour, and so hard that you can hardly stir them. You must stir it after you begin to put in your lye, till your barrel is full. Fourteen quarts of melted grease is the quantity for a barrel.

[Many families in this town make their soap according to the foregoing with perfect success.]

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April 28.—1t

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TO CORRESPONDENTS.

The following communications have been received, and will appear in the next No.

On Sugar Culture, &c., of Florida—Highlands injured by water—Account of Garnett's Expanding Harrow, and Echelon Cultivator—Remedy for the Murrain, or Carolina Distemper in Cattle—Difference of the growth and product of Grape Vines in Europe and the United States.

Erratum, in no. II, vol. III.

In communication of William Carmichael, esq., page 661, column 2, line 17 from bottom, "1000 bushels" should have been "1600 bushels." The context would enable the reader easily to correct the mistake in the figures.

THE

FARMERS' REGISTER.

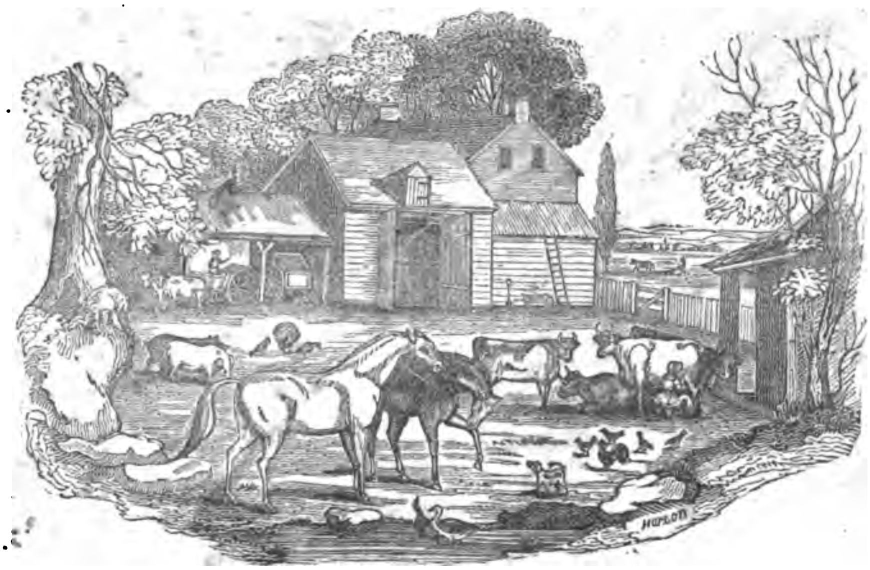
A MONTHY PUBLICATION,

Devoted to the improvement of the Practice,

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.



VOL. IV. JUNE, 1836. No. 2.

And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." *Swift.*

PETERSBURG, VA.

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THE FARMERS' REGISTER.

VOL. III. JUNE, 1836. No. 2.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

For the Farmers' Register.

ON THE AGRICULTURE OF FLORIDA.

Importance and value of the sugar crop.

Wascissa, Florida, April 12, 1836.

MR. EDITOR: The avocations of the planting season have so absorbed my attention, since my last letter, that I have had little leisure for writing. My crop being now, however, well "laid in," I avail of your favorable notice of my former communications, to send you, as promised in the conclusion of my essay, No. 4, "the details of my experience, as far as it has yet gone in this district of Florida, in the cultivation of cotton and sugar." The object of this exposition, being a comparative inquiry into the profits arising from these two valuable crops, and the *practicability* of their being here advantageously combined, must be my sufficient apology for its egotistical intrusion upon your readers. My first operations in planting, in this Territory, were begun in March, 1834. I commenced as prudence best dictated, in a "small way." The whole amount of capital invested did not exceed $12,000. The crop tended was 80 acres of cotton, 40 acres sugar-cane, and 60 acres corn and other provisions. The effective force consisted of 12 full hoe hands, and 4 boys, each with a mule and plough. I may here say that I had, at this time, newly arrived from the West Indies, and had located in the "Middle District", with the expectancy of establishing a sugar plantation; to the management of which I had been professionally bred. My greatest attention, therefore, was given, on this trial year, to the cane portion of my crop; which, to increase my labors, was entirely "rattoons," and had remained the previous winter, wholly unprotected and exposed. There were no "supplies" to be had, and the season of my commencement being late for planting, I felt no little anxiety for my "standing crop." I need not follow the details of my husbandry. I erected a *wooden mill*, with live-oak rollers, and calculated for four mules; and repaired roughly the dilapidated *log houses* which had the year previous served for the manufacture of sugar. The whole expenditure for these "make shift" requisites did not exceed $200.

The cane had a favorable season, and grew finely. At six months' age, it equalled in sweetness the West Indian cane of nine months; exhibiting therein the rapidity of Floridian vegetation, and the congenial heat of our summer for cane.

On the 24th October, "the day I well remember," there fell "a killing *frost*, that nipped me in the bud" of high and lofty expectation. Vegetation was by it destroyed; and the cane, "but yesterday," all green in rich luxuriance, now stood in the "sear and yellow leaf." I immediately began "cutting" and hurried preparations for manufacturing; in which the unprecedented earliness of the frost had found me dilatory. Indeed, I question whether the cane, injured severely as it was, could have been more taken unawares" by their *cold-hearted* destroyer, than I felt myself to be. I had not seen frost for ten years; and had not the least knowledge of its chemical action on the sugar cane. Guided, therefore, by the "usage of these parts," I persevered in boiling the cane juice, as rapidly as it could be expressed. For a week, I tried all my skill to granulate the juice; but with every addition of alkali, and all other "means and appliances to boot," which my experience could suggest, my labor was fruitless. Excess of boiling, with an excess of lime and alum, brought the juice to the consistency of paste, without the semblance of crystallization—tough and stringey. Without alkali, it burnt in syrup. I at once changed my operations, and, with a loss of near 15 acres of my cane, I ceased "boiling" and commenced "mattressing" in the field. This is a technical term, expressive of the mode practiced in Louisiana, of securing the cane against frost, and is intended when *rightly done*, to be done before the frost strikes the vegetation. Unfortunately, I had neglected the *premonitory* system; and had nothing left but mere experiment. I cut down the cane close to the ground,(digging it up with a hoe, by the roots is more advisable,) and threw three rows in one, in "wind rows," across the field, taking care to place the foliage of one stool of cane over the *buts* of the previous one; thus laying them to the height of three to four feet like a *thatched* roof. I allowed three weeks to elapse before disturbing the "mattresses," during which time, the weather was alternately cold with frost, and warm with rains. On the 20th of November, or thereabouts, I again began "grinding." To my surprise, the saccharometer exhibited an increase of two degrees, it having held only seven in October, and now gave nine. I had no longer difficulty: the sugar appeared in "character distinct," with a large, firm, and sparkling grain. The juice had become darkened in color, *almost black*, but that was easily corrected; its yield was at times, as we expressed the finer canes, fully a *pound of raw sugar to the gallon of raw juice.* I never used more than eight ounces of lime to the 100 gallons of juice. I am particular in giving you this *history* of my original proceedings; for others may, therefrom, gather experience; and, as it establishes *the fact, in my mind,* that "mattressing" the cane *for a limited* period, even after the frost, so far from injuring its return, will in this climate *increase it.* I can only account for it, in the supposition that, by evaporation, the solid juices become concentrated; and from the warmth generated by "mattressing," acquire viscidity and sweetness; and which, if not continued too long, increases the yield of sugar, but, if allowed to remain indiscreetly, would as certainly generate acetous acid, and fermentation. If this supposition be correct, it only requires to be firmly established, and generally known, to render a combination of sugar and cotton, in this district, not only a feasible crop; but, under all seasons, a certain and profitable one: and, I should be much pleased, Mr. Editor, to receive your chemical opinion on this important question.* The *results* of my crop above stated, under all the disadvantages of "rot" in the cotton, that destroyed nearly one-fourth after "bolling;" and the loss in the cane, from premature manufacture, and effects of frost, were as follows:

52 bags cotton at 16½ cents, -	$2,831 40
63 barrels sugar, (from 26 acres,) at 10 cents, - - - -	1,323 00
51 barrels molasses and syrup, at 30 cents, - - - - -	459 00
180 gallons common rum, at 50 cents,	90 00
800 bushels corn, at 50 cents, - -	400 00
Total, - - - -	$5,103 40
Deduct expenses of negroes, including rent of land, - -	1,600 00
Nett product of 14 laborers, -	$3,503 40

This crop, it must be remembered, was made in *nine months*—as I did not take possession of the land till the end of March, and was obliged to relinquish it at Christmas. I lost, therefore, a large proportion of the "refuse" of my mill; which, had time allowed, could have been profitably converted into rum. And here I would say that no one should attempt the profitable cultivation of sugar-cane, in this Territory, without first having an efficient and complete distillery. I look upon the "still-house" as being here of decidedly greater value and necessity than even the sugar-boiling apparatus. With a proper arrangement of stills, there can be no total loss sustained in the cane crop; for even should frost strike it to acidity, spirit can be extracted; and it will require a vast incease of Temperance Societies, before that *stimulant* becomes valueless.

In the West Indies, on well managed estates, the rum and molassses pay all expenses of manufacture of the sugar; and not only could it be done in Florida, but leave also, from the higher home use of spirit and molasses, a handsome revenue.

My operations for 1836 were solely in cotton. Many reasons, (exclusive of my desire to try a cotton crop alone,) here unnecessary to detail, caused me for the time being to relinquish the "higher game" of sugar. I purchased this estate, "Wascissa," and worked 36 hands. My crop had not yet been sold; but it certainly will nett me more per head than last year's "combination," owing however to the present high value of cotton; and this is the reason why so many of our cotton planters have realized this year such extravagant wages from their negroes—some even as high as $600, per head, average. Yes! Mr. Editor, I have it from unquestionable men, that our fellow-citizen, Mr. Green Chawes, has sold cotton, made last year by 22 laborors, exceeding, (with corn,) $13,000. But yet I do not yield determined preference for cotton. As long as the demand will give 20 cents, or even 15 cents, per pound, it is undoubtedly a money-making culture, and sufficiently so to annihilate any other substitute; and even at 10 cents per pound, it is unquestionably a more expedient entire crop than sugar; and no prudent man will, under any circumstances, in my opinion, here, attempt a sole crop of sugar: its results must and will be, nine times in ten, complete ruin. I advocate only sugar in combination with cotton; and I conceive that if it can be shown not only practicable in this climate, but profitable, that I am "doing good unto many," and especially advancing, in such event, incontestible proof that our Florida lands are, (as I have before stated in a former letter,) "the cheapest in the southern country." To expose clearly my reasoning, let us instance an estate, first, with cotton alone; secondly, with cotton and sugar combined; and, lastly, with sugar by itself. We must, in this comparison, reduce our calculation to "dollars and cents;" that method of reasoning being, as it were, innate in all planting readers, and, to do so fairly, we must take the staples at a fair average value. Say—cotton 10 cents per pound, and sugar 10 cents per pound.

Instance First.

B has a plantation of choice land, well located,

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*Our correspondent attaches much more importance than is due to our opinions on vegetable chemistry; but being thus called on, we will state our impression. It cannot be, (as he suggests,) that the concentration of the saccharine juice can cause its yield to be greater; but the other supposition may well be correct, that the process of "mattressing," by generating and maintaining a greater degree of heat, may produce chemical changes in the juices of the canes, and actually increase the quantity of sugar. All the different matters which form vegetables, as sugar, starch, mucilage, wax, oil, &c., are each composed of the same three elementary bodies, viz. oxygen, hydrogen, and carbon, merely varied in their proportions. Of course, each of these many substances could, by a slight change of its quantities, in nature's laboratory, be changed to any other. Even art can effectually produce some of these changes. Thus, chemistry has shown the certain means of converting starch into sugar; but at a cost too great for economical purposes. The slightest observer may know, that nature is working similar changes throughout the whole course of vegetable life. For example: the saccharine juice is formed abundantly in the stalks of growing Indian corn, and the sugar increases faster than the bulk of the plant, nearly to the time of the maturing of the grain. But, about that time, the sweetness of the pith is lost, by the sugar being entirely converted to some other vegetable substance—and probably to furnish starch, which, forms so large a portion of the grain. Now, as nature in this case, changes sugar to starch (or something else,) so the increase and maintenance of heat in sugar canes may change starch, mucilage, &c., to sugar; and this change is the more likely, as, in a climate sufficently warm, the successful effort of nature, at that period of the growth, is to increase the proportion of sugar in the plants; and that increase, of course, is effected by changing other existing vegetable products to sugar. When nature is making an effort to produce a certain chemical change, (which, however, may be thwarted or enfeebled by climate or other adverse circumstances,) it is not difficult to contrive artificial means for aiding that effort, and thereby giving it full effect; and such seems to be the operation and effect of "mattressing."—Ed. Far. Reg.

and under skilful management, consisting of 500 acres of open land, cost, -	$10,000
His effective force are 50 hands—cost,	30,000
And, 15 mules, with plough-gearing, &c. cost, - - - - -	1,500
His gin-house and machinery, cost, -	500

Thus, with a capital invested of - $42,000 B commences his cotton crop. The whole 500 acres being well cultivated, shall yield him the maximum average of 1000 pounds raw cotton per acre, making, gross, 500,000 pounds cotton as the saved crop. Now, it is a minimum calculation to allow only three-fourths loss by ginning, &c. To be fair, we however, will now allow it. 500,000 pounds raw cotton will, therefore, give 125,000 pounds of clean cotton, fit for market.

B sells, as his crop, 125,000 pounds cotton at ten cents, - - - -	$12,500
Deduct expense of negroes, cost of bags, &c., - - - - - -	2,500
Leaves him about 24 per cent. gain on invested capital, or - - .	$10.000

Is this not a fair calculation? and does it not show a very profitable investment? Let us proceed, however, to our second instance, viz. cotton and sugar combined.

Second.

D. has an estate like B., both in land, and effective laborers. It is worth the same,	$40,000
D having an intention to make sugar, has outlaid in mules, and extra requisite machinery, - -	5,000

Thus, with an invested capital of $45,000 D. begins planting: he plants 400 acres cotton, and the remaining 100 acres of his land, in sugar cane, being the largest proportion of cane, his knowledge of the climate, and the efficiency of his laborers can permit him to make: he has the same seasons as B, and his cotton yields him the same per acre, viz. 1000 pounds. The season for cane is an average one; and there being more risk in climate for its success, than for cotton, we will not take the average yield in Louisiana for the cane, (though strictly it would be but just,) but assume that D has to mattress his cane, to save it from frost. On grinding it, it will still yield him 1000 gallons of juice per acre, which is equal, under all circumstances, to 500 pounds of sugar. (In Louisiana, 100 pounds of sugar, per acre, is an average yield; in the West Indies from 3000 to 6000 pounds: admitting, however, every uncertainty of the climate, and the hurry of manufacture, D's crop will turn him out as follows: viz.

400,000 pounds raw cotton equal to 100,000, clean, at 10 cents, -	$10 000
100 acres cane at 500 pounds per acre; 50,000 pounds sugar at 10 cents, -	5,000
50,000 pounds of sugar will drain at least 4000 gallons molasses, -	1,200
And the "scummings and refuse" of the mill will, with washings of sugar and molasses cisterns, return by distillation, a barrel of rum for every hogshead of sugar; i. e., 1,800 gallons spirit for 50 hogsheads	1,350
Total proceeds of crop - - -	$17,500
Deduct same average expense as before for negroes, &c., 2,500, and add thereto, for extra expenses, attending the manufacture of sugar, $500 - - -	3000
Leaves D. nearly 33 per cent. gain, or	$14.550

The above I hold to be a very moderate estimate on the sugar cane, and it evinces my desire to give the cotton every allowable advantage in the estimate by my giving 1000 pounds per acre of that staple, and only 500 pounds of sugar. I do not myself question the practicability of the above combination, and that it is profitable, is there shown in the accuracy of figures. That it has not yet been attempted here, has been owing, originally, to the limited capitals of our first settlers, the want of the requisite practical knowledge and efficient machinery; and, lastly, to the *monomania* which the rise of cotton has created. The failure, likewise, heretofore, when sugar mania ran as wild as cotton bigotry does now, of those experimentalists, who imprudently ventured their all on sugar, has caused the very mention of the staple to be considered synonymous with "loss;" and enough to rank its advocate as another of the "visionary theorists." This does not present my impartial consideration of the matter; and should not deter a right view of the subject, merely because we have only, as yet, the errors and failures of others to attract our attention. That because an entire crop of cane is here, at all times, hazardous, and most often ruinous, does it necessarily follow that the plant, *sui generis*, is impoverishing, and, with all its luxuriance, unprofitable? The season for manufacture may not admit of the saving of 500 acres of cane; but it assuredly will admit of 100 acres being profitably saved, with 50 effective hands, and requisite machinery; and that too, without any serious sacrifice of cotton, or great loss of labor. It is erroneous, as is here generally believed, that the manufacture of a sugar crop will essentially interfere with, and diminish the cotton crop. In the proportions of one-fifth cane, there can be no such interference—admitting that the earliness and severity of frost, is such as to compel the immediate service of all your laborers to the security of the cane. Your 50 hands will mattress it, (100 acres,) in three to five days—where it may lie for a month. Half your force, with tried machinery, will then manufacture it in a fortnight, without any extra labor; and your other remaining half of laborers will certainly, at that season, save all the cotton that is liable to fall. It is not, however, one year in ten, that the season would compel this entire disposition of your laborers; and certainly your chance of revenue from two crops, not liable to the same disasters, (for none can deny that the cotton plant has nearly as many risks to run before its fruit is saved, as the cane,) is more than equivalent to a moderate loss, by a heavy blow of cotton. No one should attempt the cane cultivation as a source of revenue, with a less force than 50 effective hands; and I attribute the heretofore failures of sugar here, in a great measure, to over-cropping, and a poverty of laborers. I need not further extend this already attenuated letter. The exposition of my third "instance" in sugar alone, may be left as it is. Sufficient will be gathered from the foregoing remarks, that I disapprove, under the liabilities of our climate, the risk of an entire sugar crop; and it not being the purpose of these "inquiries," to exaggerate, or enhance the really existing advantages of our climate, by any Quixotic operations, the results of an entire cane crop, may certainly be considered as dubious, or in ratio with the sanguine temperament of its advocate.

I am fully aware, that the force of theory, even when established by individual success, cannot controvert the universal belief of "uncertainty;" and whenever the disposition of men are confident of gain in one line, but diffident of their skill in another, no other reasoning can convert them, save interest and necessity. It will, therefore, need that cotton should decline, (as it most assuredly must,) below 10 cents, before our cotton fatuists can be severed from their affection. To those abroad, however, not yet infatuated, whose attentions may be inclining to a southern residence, I feel assured that my remarks will be estimated, (as they really are,) as the candid expositions and belief of one, in as far as another's fortune may be concerned, perfectly disinterested. I cannot but conceive it inexplicable, that, whilst all are intently watching the probable rise and fall of the cotton market, with the universal knowledge that its culture and product are annually and amazingly increasing, and to continue until the vast area of the south and west are no longer fertile; that the certain scarcity of sugar, and its as certain great demand, does not bring the mind to the reflection of the fact, that its culture is rapidly decreasing, and the lands acclimated for its production, extremely limited, and not to be extended. How peculiarly is this the case with this portion of North America! The time must come, when, with all its fluctuations of climate, Florida will be the sugar-growing section of these United States.

With the assurance of my acknowledgments for your favorable acceptance of my past communications,

I am, your obliged and obedient,

FARQ. MACRAE.

QUERIES ON POLITICAL ECONOMY, AS CONNECTED WITH AGRICULTURE.

To the Editor of the Farmers' Register.

Though I am no farmer, and no subscriber to your work, I yet consider it of great public benefit, and should rejoice to see it circulate even more extensively than it now does. Permit me to suggest one or two thoughts which have occurred to me, in looking over some of your late numbers.

In your last, Vol. III. No. 12. page 757, you say that the universal tendency of all legal inspections of the qualities of commodities, is to deteriorate their quality—and of course, their market price. Was this assertion well weighed? Is it true? The subject is so important to our commerce, and yet more to our agriculture, that if it be true, our law makers ought to know it. As the chancery lawyers say I "neither admit nor deny the allegation," as it is not within my knowledge—but call on you for proof.

Again—you frequently speak of poor-laws as being of unquestioned evil effect, and refer to England for proof. Are not the population of England, even drown to the lowest laborers, better off than the like classes on the European continent? Are they not better off than their fellows in Ireland? Do not even the English whigs, (whom I believe to be of the same school with yourself in political economy,) propose to introduce that system into Ireland? I would say to you as the editor of the Enquirer says to his opponents, "give us light." Or will your correspondent Mr. Walker, give his light on these last points? As a native Briton he has seen the practical workings of the system, and in this age of repetition, and borrowing, and plagiarism, it is very pleasant to meet with the opinions of a thinker and writer so original as he, even though we should not entirely agree with him.

Important topics as slavery and the management and treatment of slaves are to agriculturists of the south, it seems that few of the intelligent gentlemen who send their contributions to the Register, have thought proper to discuss any question connected with this class of our population. Is not this unwise? Delicate as this subject is in many respects, there are some of its features, concerning which, an interchange of opinions would be advantageous, and, as I suppose could be carried on, through such a medium as your magazine, without giving offence to the most sensitive. An article on the profits of rearing slaves, which you once published, affords one example of the class of subjects to which I allude. Are your columns open for prudent discussions, or inquiries on these subjects, from loyal Virginians, or inhabitants of other southern states?

You frequently urge your readers to become writers, and furnish you with original matter. Many would perhaps do this, if their minds were directed to particular points on which information is specially desirable. Would it not be well for you to publish queries, to which your contributors might furnish answers, or to suggest particular subject, concerning which, you especially desired information?

A. B.

[Our correspondent's suggestions it is hoped, will not pass unheeded, nor fail to elicit some communications from other correspondents, of interest and value. To *others* we would prefer to give place, in treating either, or all the subjects proposed. With regard to the ill policy of legal inspections of the quality of commodities, our opinion has long been fixed—and if time permitted, and the occasion required, we would not fear to attempt the maintenance of our position by argument, and by facts. But we certainly should have no hope of convincing, or even of attracting the notice of "our law-makers," as a body. Our opinion is not less decided, as to the impolicy and ill effects of the general operation of the poor-law system, both in England, and this country—and there is no branch of political economy, more closely connected with the interests of agriculture, or more suitable to be disussed in an agricultural journal. But we confess our inability to treat properly and fully, so wide a subject—or to compress within suitable and proper limits, even the imperfect lights which we have: and therefore, would greatly prefer, that the task should be undertaken by another.

Slavery, and the management of slaves, as connected with our agriculture and domestic economy, are certainly proper subjects to be discussed in this journal. To deny that position would be almost as absurd, as to omit in such a journal, all reference to the improvement of land—for in the southern states, the agricultural capital vested in slaves, and the products derived, directly or indirectly, from the labor, are scarcely inferior, in value and importance, to the capital in, and products from, land alone. Still in these distempered times, when there is so much madness and folly afloat, on the general subject of slavery—so much fanaticism in the north, on one side of the question, and not a little in the south, on the other side, discussion on this subject is rendered difficult to regulate, and to restrain within proper limits,—and therefore would require much caution and self-restraint on the part of all who may undertake to treat on slavery.

With regard to the insertion of queries, if our correspondent had been longer acquainted with this journal, he would have known, that the practice which he recommends, has been adopted to considerable extent: but it is to be regretted, that there are fewer answers than questions. If every difficulty were stated in the form of a query—and every person who possessed the information wanted, would promptly furnish it in answer, that plan of mutual accommodation and instruction, alone, would make the journal which was the channel of such intercourse, of incalculable value to farmers, and to the improvement of agriculture in general. That simple means alone, fully carried into operation, would give to each reader the benefit of the lights of all others—and would make the journal a general "intelligence office," where any kind of existing information could be obtained, by merely asking for it.]

HIGHLANDS INJURED BY WATER.

To the Editor of the Farmers' Register.

Wardsfork, Charlotte.

I have appeared so often on your pages of late, I judge I shall be charged by some of your readers with being urged by an itch for scribbling. I acknowledge it is a disease to which I am a little subject—but really I think, there is more apology for those who labor under this pen-complaint, than those who seems to be possessed by an uncommunicating devil, who will write nothing for fear of being charged with vanity. For my part, I think this morbid sensitiveness, in some instances indicates the very highest degree of vanity, that cloaked under the garb of humility. I am acquainted with some of our best practical farmers; who, if they could be induced to publish, might be of much service to our agricultural interest. But enough of this.

Much has been said about the injury done to lowlands, by water: but little notice has been taken of the bad effects of excessive wet, on high lands. Indeed it is scarcely thought that highlands are injured by wet, except those soils that are called springy. But all soils I think, are rendered less productive by remaining level, while exposed to the drenching rains of winter. Whether this is owing to some mechanical or chemical changes, I have not determined by experiment: for I make but few experiments of any sort. Having constantly before me Nature's great laboratory, if I can so speak,—I watch her operations and results, and collect facts in a way more agreeable to myself and my employments as a farmer. For while I was making in-door experiments on soils, I am sure the practice would be bad without. I generally place myself in a situation, that while I am learning from Nature, I can take a peep at Cuflee, and the overseer, and see that they are practicing, while I am contemplating. I am quite sure if I were often engaged in making small in-door experiments, and it was known to the *slip-gap fraternity* of our parts, there would be very fatal results to my corn field.

But to the subject: I have noticed that those spots of highland which have kept wettest from their being so situated as to collect and retain excessive moisture, are sure to fail in making a satisfactory "turn-out," particularly in wheat; while on the other hand, the driest and most elevated portions, more than fulfil their promise. I have noticed two concave surfaces, containing about a half acre each, in which the rain-water gathered, and kept "sobbed" during winter; but, would become dry enough (aye, too dry—for it is of all earth the dryest in summer,) to induce an attempt at cultivation with the rest of the field—but which, uniformly failed to produce. It is a little curious to see how lively and light the soil of ditch-banks, and other elevations looks in the spring, compared with the adjacent level places, and how much quicker it moves vegetation. I have observed that hill-sides from which the water most readily escapes, will produce best, agreeably to the fertility. sloopes are better than entire levels, for the same reason. I will here observe, though from the point, that our lowlands even where it has been attempted, are generally not more than half drained. I never saw but one perfectly drained piece of low-grounds, a piece of John F. Edmunds', of Wardsfork. It is made perfectly free from any degree of "sobbing," winter or summer, by the most skilful ditching, and the heaviest crop of corn I ever saw any where, it yielded last season. But to the highland, the practice which my view of the subject suggests is quite plain. Place the land for cultivation as near as you can in that situation, which nature has placed the most productive spots, viz: in a situation that will preserve it from the least sobbing from winter rains. For this purpose, I would recommend all uplands to be left in beds, and particularly for wheat. Where soil is naturally of a wet character, as some of our highlands are from their level situation, or from a bad clay, it is greatly improved by ditching.

I. R.

From the British Farmer's Magazine.

AGRICULTURE IN FLANDERS.

It is a pleasure to observe the laborious industry of the Flemish farmer, recruited by intervals of comfortable and decent refreshment; and not less agreeable to perceive the farm servants treated with kindness and respect; and who uniformly dine with the farmer and his family. In Flanders the gentlemen are all farmers, but the farmes do not aspire to be gentlemen, and their servants feel the benefit. They partake with them a plentiful and orderly meal, which varies according to circumstances. The laborer is in general very well able to support himself by his work; in a country where so much manual labor is required in weeding, the laborer's family is occupied pretty constantly in summer; and in winter they spin. Each day-laborer has, in most cases, a small quantity of land, from a rood to half an acre, for his own cultivation. In common times, a begger is scarcely to be seen, except in the towns, and but few there. In the country, habits of industry are kept up till health fails; and to meet the infirmities of age, the poor possess a revenue from pious donations, regulated by the government, and vested by them in commissions, of which the mayors of the different communes are presidents respectively, in right of their office. The Flemish farmer seldom amasses riches, but is rarely afflicted with poverty: industry and frugality are his characterstics; he never looks beyond the enjoyment of moderate comforts; abstains from spirituous liquors, however easily to be procured; never exceeds his means; pays his rent punctually, and in case of emergency, has always somewhat to command beyond his necessary disbursements. This is effected too upon a soil naturally the reverse of rich; and, in fact, a bad soil. Yet such is the effect of industry, sobriety, and skill, that there are about five souls to eight English acres. Notwithstanding this, oné-third of the produce of the land is annually exported!—than which no circumstance can better mark the skill, the industry, and the frugality of the Flemish farmer. In England, Sadler says there are about ten souls to every twenty acres. In Ireland, thirty acres to ten persons. What will the Malthusians and emigrationists say to this, who recommended the transportation of our surplus hands, and, of course, of our best and most efficient laborers! The soil of Flanders, far inferior to our own, can sustain twice the amount of human existence. The secret of this is, that the work is done by the spade and hoe. The farms are all small, though "rent and taxes" are heavy; but the farmers and laborers are sober, skilful, industrious, and frugal.

SALE OF FINE CATTLE.

The following is an account of sales made in Philadelphia, by Mr. John Hare Powell, of his fine Durham cattle:

A poor bull calf, 4 weeks old, sold for -	$120
Cow No. 1, - - - - - - -	600
Cow No. 2, - - - - - - -	650
Cow No. 3, - - - - - - -	510
Cow No. 4, - - - - - - -	560
A calf, No. 5, - - - - - -	300
Bertram, No. 6, - - - - - -	500
Do. No. 7, - - - - - - -	480
The lowest cow sold for, - - - -	155

Mr. Powell's Durhams brought higher prices than the stock cattle of the late Jeptha D. Garrard, sold on the the 8th, at Cincinnati. The finest two year old heifer, went off for $575, a heifer, one year old, for $510; a full-blooded Durham bull, 2 years old, for $465, &c. &c.

SOME NOTICE OF THE PRIVATE LIFE OF THE MARQUIS DE TOURBILLY.

Extract from Young's Travels in France.

[The readers of the account of the labors and improvements of M. Turbilly, which was re-published in the last two numbers of this journal, will perhaps be gratified with the following statements and remarks of Arthur Young. Though few will feel any thing of enthusiastic admiration expressed by Young; many may feel some interest in the private history and fortunes of a man, who like most others of the class of agricultural improvers, labored much more successfully to promote the public interests, than his own.]

* * * * Letters from Mons. de Broussonet; but he is unable to inform me in what part of Anjou was the residence of the marquis de Tourbilly; to find out that nobleman's farm, where he made those admirable improvements, which he describes in the *Memoire sur les defrichemens*, was such an object to me, that I was determined to go to the place, let the distance out of my way be what it might. * * * * *

My first business here, as everywhere else in Anjou, was to enquire for the residence of the marquis de Tourbilly. I repeated my enquiries till I found that that there was a place not far from La Flêche, called Tourbilly, but not what I wanted, as there was no Mons. de Tourbilly there, but a marquis de Galway, who inherited Tourbilly from his father. This perplexed me more and more; and I renewed my enquiries with so much eagerness, that several people, I believe, thought me half mad. At last I met with an ancient lady who solved my difficulty; she informed me, that Tourbilly, about twelve miles from La Flêche, was the place I was in search of: that it belonged to the marquis of that name, who had written some books she believed; that he died twenty years ago, insolvent; that the father of the present marquis de Galway bought the estate. This was sufficient for my purpose; I determined to take a guide the next morning, and, as I could not visit the marquis, at least see the remains of his improvements. The news, however, that he died insolvent, hurt me very much; it was a bad commentary on his book, and I foresaw that whoever I should find at Tourbilly, would be full of ridicule of a husbandry that proved the loss of the estate on which it was practised.

The 29th. This morning I executed my project; my guide was a countryman with a good pair of legs, who conducted me across a range of such ling wastes as the marquis speaks of in his memoir. They appear boundless here; and I was told that I could travel many, many days, and see nothing else: what fields of improvement to make, not to lose estates! At last we arrived at Tourbilly, a poor village, of a few scattered houses, in a vale between two rising grounds, which are yet heath and waste; the chateau in the midst, with plantations of fine poplars leading to it. I cannot easily express the anxious inquisitive curiosity I felt to examine every scrap of the estate; no hedge or tree, no bush but what was interesting to me. I had read the translation of the marquis's history of his improvements in Mr. Mills' Husbandry, and thought it the most interesting morsel I had met with, long before I procured the original *Memoire sur les defrichemens;* and determined, that if ever I should go to France, to view improvements, the recital of which had given me such pleasure. I had neither letter nor introduction to the present owner, the marquis de Galway. I therefore stated to him the plain fact, that I had read Mons. de Tourbilly's book with so much pleasure, that I wished much to view the improvements described in it; he answered me directly in good English, received me with such cordiality of politeness, and such expressions of regard for the purport of my travels, that he put me perfectly in humor with myself, and consequently with all around me. He ordered breakfast *a l' Anglaise;* gave orders for a man to attend us in our walk, who I desired might be the oldest laborer to be found of the late marquis de Tourbilly's. I was pleased to hear that one was alive who had worked with him from the beginning of his improvements. At breakfast Mons. de Galway gave me an account of his father's acquiring the estate and chateau of Tourbilly. His great-grand-father came to Bretagne with King James II. when he fled from the English throne; some of the same family are still living in the country of Cork, particularly at Lotta. His father was famous in that province for his skill in agriculture; and, as a reward for an improvement he had wrought on the *landes*, the states of the province gave him a waste tract in the island of Belleisle, which at present belongs to his son. Hearing that the marquis de Tourbilly was totally ruined, and his estates in Anjou to be sold by the creditors, he viewed them, and finding the land very improveable, made the purchase, giving about 15,000 louis d'ors for Tourbilly, a price which made the acquisition highly advantageous, notwithstanding his having bought some law-suits with the estate. It is about 3000 arpents, nearly contiguous, the seigneury of two parishes, with the *haute justice*, &c. a handsome, large, and convenient chateau, offices very complete, and many plantations, the work of the celebrated man concerning whom my inquiries were directed. I was almost breathless on the question of so great an improver being ruined! "You are unhappy that a man should be ruined by an art you love so much." Precisely so. But he eased me in a moment, by adding, that if the marquis had done nothing but farm and improve, he had never been ruined. One day, as he was boring to find marl, his ill stars discovered a vein of earth, perfectly white, which on trial did not effervesce with acids. It struck him as an acquisition for porcelain—he shewed it to a manufacturer—it was pronounced excellent: the marquis's imagination took fire, and he thought of converting the poor village of Tourbilly into a town, by a fabric of China. He went to work on his own account—raised buildings—and got together all that was necessary, except skill and capital. In fine, he made good porcelain, was cheated by his agents, and people, and at last ruined. A soap manufactory, which he established also, as well as some law-suits relative to other estates, had their share in causing his misfortunes; his creditors seized the estate, but permitted him to administer it till his death, when it was sold. The only part of the tale that lessened my regret was, that, though married, he left no family; so that his ashes will sleep in peace, without his memory being reviled by an indigent posterity. His ancestors acquired the estate by marriage in the fourteenth century. His agricultaral improvements, Mons. Galway observed, certainly did not hurt him; they were not well done, nor well supported by himself, but they rendered the estate more valuable; and he never heard that they had brought him into any difficulties. I cannot but observe here, that there seems a fatality to attend country gentlemen whenever they attempt trade or manufacture. In England I never knew a man of landed property, with the education and habits of landed property, attempt either, but they were infallibly ruined; or if not ruined, confidently hurt by them. Whether it is that the ideas and principles of trade have something in them repugnant to the sentiments which *ought* to flow from education—or whether the the habitual inattention of country gentlemen to small gains and savings, which are the soul of trade, renders their success impossible; to whatever it may be owing, the fact is such, not one in a million succeeds. Agriculture, in the improvement of their estates, is the only proper and legitimate sphere of their industry; and though ignorance renders this sometimes dangerous, yet they can with safety attempt no other. The old laborer, whose name is Piron, (as propitious I hope to farming as to wit,) being arrived, we sallied forth to tread what to me was a sort of classic ground. I thall dwell but little on the particulars: they make a much better figure in the *Memoire sur les defrichemens* than at Tourbilly; the meadows, even near the chateau, are yet very rough; the general features are rough: but the alleys of poplars, of which he speaks in the memoir, are nobly grown indeed, and do credit to his memory; they are 60 or 70 feet high, and girt a foot: the willows are equal. Why were they not oak? to have transmitted to the farming travellers of another century the pleasure I feel in viewing the more perishable poplars of the present time. The causeways near the castle must have been arduous works. The mulberries are in a state of neglect; Mons. Galway's father not being fond of that culture, destroyed many, but some hundreds remain, and I was told that the poor people had made as far as 25lbs. of silk, but none attempted at present. The meadows had been drained and improved near the chateau to the amount of 50 or 60 arpents; they are now rusty, but valuable in such a country. Near them is a wood of Bourdeaux pines, sown 35 years ago, and are now worth five or six liv. each. I walked into the boggy bit that produced the great cabbages he mentioned, it joins a large and most improvable bottom. Piron informed me that that the marquis pared and burnt about 100 arpents in all, and he folded 250 sheep. On our return to the chateau, Mons. de Galway finding what an enthusiast I was in agriculture, searched among his papers to find a manuscript of the marquis de Tourbilly's, written with his own hand, which he had the goodness to make me a present of, and which I shall keep amongst my curiosities in agriculture. * * * * *

MINERAL MANURES.

Extract from No. 46 of the *Farmer's Series* of the *Library of Useful Knowledge* first published in London, Nov. 15, 1833.

The manures we term *alkaline* and *calcareous* consist chiefly of those substances which combine with acids, though generally with the loss of their distinctive characters, and out of which lime may be extracted by the process of burning. The extent of their utility is only ascertained by practice, which does not speak a uniform language in every place, for scarcely a farmer is to be found who is acquainted with the exact effects of their properties upon soils; from which it may be readily imagined that many will form erroneous opinions, arising out of the local circumstances of their own farms. Their chief advantage, in a natural state, seems, however, to be rather mechanical and alterative, than nutritive. They form a useful component part of the earth; and, in certain proportions, they are found to be essential to the fertility of most soils, or 'perhaps necessary even to their proper texture, as an ingredient in the organs of plants.*' The primitive constituents of which they are formed are composed of chalk, of limestone, or of the shells of fish—and on being submitted to the action of fire, lime is produced.

Chalk

Is a pure calcareous earth, though in almost all cases mixed with particles of clay and sand, which deteriorate its quality, in whatever proportion they exist; it is, therefore, highly important that the farmer should ascertain those proportions, for, when combined with clay, such chalk is most fit for light loams and sandy soils, which it tends to unite, while stiff lands will, on the contrary, be proportionably most benefited by the opposite mixture, and should be applied in the different proportions which the respective qualities of each seem to require. It is, however, frequently laid without discrimination upon every kind of land, though the proper number of bushels necessary for each particular soil can only be accurately determined by a descriminating knowledge both of the different properties of the chalk, and of the ground to which it is intended to be applied. From ignorance of this, farmers are generally without any rule to guide them in its application; but supposing them, from long experience, to have discovered the exact quantity of some particular chalk proper for their own soil, this knowledge can only be local, and cannot enable them to decide upon its effect in other situations.†

When unmixed, its properties in all respects resemble those of pure lime, and the chief motive for burning either that, or limestone, is, that it may be thereby the more easily reduced to that state of powder, and spread upon the ground, by which it can be rendered a more effectual dressing for land. The operation also considerably reduces its weight by the evaporation of the water contained in it, so that, in case of very distant carriage, the cost of fuel may be saved by the difference in the expense of conveyance. The cost of delivery from any great distance is indeed so considerable, as almost to preclude its use, except in the immediate vicinity; and even there, it is usually carted upon the land during hard frosts, when the teams are not otherwise occupied. When laid upon the land in the simple state of chalk, it is also apt to become hard by the drying effects of the wind and air, and as it is dug up in large lumps which cannot be reduced without considerable labor, it thus remains for a considerable length of time, without producing its intended effect upon the soil. When thus used, therefore, it should be taken from the pit in either the latter part of the autumn or the the beginning of winter, while its pores are full of water; for if frost then comes on, it becomes expanded in the act of freezing, and thus bursting suddenly, it crumbles partly into a kind of slime. This, however, leaves the operation to chance; it is, therefore, better to break the chalk into as fine pieces as possible: for otherwise, being exposed to the winds of the spring months, it becomes so dried and hard, that the harrows will take no effect upon it, and to roll it, will only serve to compress it into the earth without breaking it. By this irregularity, too, in its division, a great deal of the seed would also remain uncovered, and its period of ripening being thus more forward where the manure was laid than where the land was left bare, a porton of the crop would be ready to be reaped while the remainder might be still green.

From this difficulty, the use of chalk has been much discontinued, though the fault is not so much in the chalk itself as in the manner of treating it. Regard must necessarily be had to the quality of the chalk, to the tenacity of the soil, and also to its state of poverty or improvement. The quantity laid upon the land is variable, and more governed by convenience than by any scientific notion of its properties: from 400 to 600 or 1000 bushels, and even more, is by no means unusual. It is very commonly laid upon coarse sour pasture at the rate of 150 to 250 bushels per acre, upon which it almost uniformly effects an evident improvement, bringing it from a rush-like appearance, to a fine, sweet, and delicate herbage, intermixed with white clover and the richer grasses, which otherwise remain dormant in the ground. The same good effect is also found when applied to hot gravelly loams, where its cooling properties counteract their tendency to burn in the summer months; and on land subject to sorrel it is a sovereign cure, killing that weed speedily—a circumstance favorable to stock, for it is very unwholesome to sheep, and many lambs are frequently killed by eating it.‡ It also imparts a mellowness and friability to clays and other strong soils, which prove advantageous to the growth of most kinds of corn, and it likewise assists the adhesiveness of sands, but it can never be usefully applied to land of the same nature as that from which it is drawn: its efficacy is therefore proportioned to the deficiency of calcareous matter in the natural soil.

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* Sir Humphrey Davy. Agr. Chem., p. 19.

† 'Pure chalk, being saturated with carbonic acid gas, tends to alter the original disposition of the parts of the soil, where it meets with various substances, either vegetable, animal, or mineral; these substances becoming oxygenated by their action with the chalk, generate their several acids, and these acids disengage the carbonic acid gas, which is readily absorbed by the roots of the plants; it therefore tends, by slow degrees, to separate the cohesiveness of the strong soil, and to admit the roots of the plants to feed upon the carbon with greater facility.'—Malcolm's Comp. of Husb. and Anal. of Manures, vol. ii. p. 32.

‡ Malcolm's Survey of Surrey, Kent, and Sussex, vol. ii. p. 30—39; Young's ditto of Hertfordshire p. 161.

It is not however possible to get hard chalk thus to break entirely into small pieces, and much of it will remain, perhaps for years, without being reduced by the weather: if, therefore it be intended to produce the same immediate effect as lime, it should be applied in perhaps three, or even four times the same quantity; but its decomposition being more slow, it will also be more lasting. When found of a soft and unctuous quality, it has been laid with remarkable effect on gravel mixed with a small portion of clay, in sufficient quantity to afford a covering of an inch, or an inch and a half, in thickness. Previously to its application, this land was so extremely precarious in its produce, that, although manured, folded abundantly, and trodden by sheep to condense the soil, the expense and care bestowed upon it were rarely compensated by a corresponding return. The wheat grew freely at first, and continued to bear a very favorable appearance until the spring, when the ground assumed a spongy, hollow texture, the plants acquired a dark brownish hue, died in considerable quantities, and only produced from 12 to 16 bushels per acre of light corn, with the straw invariably stunted and blighted; but the same land now yields from 24 to 30 bushels, of excellent quality. The barley, oats, tares, and clover suffered in the same proportion, and have equally derived benefit from the chalking; nor has there been any recurrence of the former unhealthy condition of the soil.*

When employed for the purpose of chalking the surrounding land, it is usually dug out of pits, which are sunk to a considerable depth, by contractors, who travel over the different parts of the country where it is generally found. The common practice on such farms is to fix upon a spot nearly central to about 6 acres of land, where a pit, about 4 feet in diameter, is sunk to the chalk, if found within 20 feet from the surface; if not, the contractors fill it up, and sink in fresh places, till their labor is attended with better success. The pit, when sunk, is kept from falling by a sort of basket-work, made of brush-wood, cut green to make it the closer; it is then chambered at the bottom—that is, the pitman digs or cuts out the chalk horizontally in three separate directions of sufficient height and width to admit of their being worked with safety. The laborers are generally three in number—one of whom digs the pit and fills the basket, which is raised by a pulley of very rude construction, which is then wound to the top by his companions, who alternately wheel its contents upon the land. In some places 18 barrowfuls, and in others 16 buckets, which each hold 1½ bushels, are deemed a load, 100 of which are considered as the full extent of chalking an acre, though 40 to 60 is a more usual quantity. The expense varies acccording to the depth of the chalk, as it is found to be better the deeper it lies; and when only 3 or 4 feet from the surface, it is generally so indifferent as to be again thrown into the pit when filled up. In the chalk districts, it is very commonly applied at periods varying from a dozen to twenty years, and with equally various accounts of its success, though its first application is always admitted to be the most effectual. When well mixed with the land, it is generally acknowledged to make it work much better, and with less strength of cattle on heavy ground; and if assisted with dung, or with occasional spring-dressings, to quicken vegetation, it is very universally allowed to improve the crops: its value is often estimated between outgoing and incoming tenants, when lately laid on, as high as £6 per acre.*

Limestone.

The *properties of limestone* are similar, though it is very generally believed that lime made of very hard limestone is more efficacious as manure than that which is made from materials of a softer nature, and hence it is commonly asserted that lime made from chalk is much weaker.† In some places, however, chalk-lime is preferred. Thus we are told by Mr. Boys that, although there is excellent limestone in the centre of the Weald of Kent, yet lime made of chalk is brought from the distance of twenty miles. This might be attributed to a knowledge of the superiority of its practical effect as ascertained by is greater purity and consequent strength; but it would rather appear that the preference arises from caprice, for he also says that chalk is even carried for a considerable distance to the parish of Bethersden, which is famous for a fine limestone.‡ The fact, however, is, that whichever contains the greatest quantity of calcareous matter will be found to be the strongest. If employed without being burned, its effects upon the land are very slow: it acts upon the soil during many years as a mild calcareous earth, but its duration and effects are proportioned to its purity, as the less alloy which it contains, the stronger will it be, and the operation of changing it into lime is of no farther use than as a mode of rendering it more promptly effective. It is also the least expensive, wherever fuel can be obtained at a moderate price; for its weight is thereby reduced to nearly one-half, and it cannot be brought into use as manure without being reduced to powder, the labor of which is very great, while the weight, and consequent charge of carriage, of course remain undiminished.§

Limestone, however, is found in great abundance in many places in which there is a great scarcity of fuel; and a scheme was accordingly suggested to the trustees of the forfeited estates in Scotland,by the late Lord Kaimes, for the erection of a crushing-mill, by means of which great masses of rock, when broken into pieces, were reduced to powder. It was erected in the Highlands, at a period when there existed but little spirit for improvement; and we learn from Dr. Anderson, that, 'as there was no public demand for the manure, after the experiment was sufficiently tried to show that it might be practised with advantage in other places, the mill was suffered to lie unemployed;'* but it is said, in the Survey of the county of Perth, that the machine was swept away by a flood before the benefits of the process could be sufficiently understood. It might, however, be well worth the while of extensive proprietors of land which is locally deprived of the assistance of lime,by the want of coals, or peat, to erect similar machines, as few doubts can be entertained of their utility; for though unburnt limestone, when reduced to powder, has not the same activity as that which has undergone the action of fire, it is yet a valuable article; and, as a gradual improver of the soil, it may even be rendered more useful than quicklime.

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*See Mr. Gawler's account of his farm in North Hampshire: Library of Useful Knowledge, Farmer's Series, No. 7.

* Herts. Report, p. 156; Bucks. do., p. 269; Beds. do., p. 495; Berks. do., p. 861; Essex do., p. 205; Kent do., p. 158.

† Anderson's Essays, 4th edit., vol i. Essay vi. part ii.

‡ Boys's Survey of Kent, 2nd edit. p. 89.

§ Dr. Anderson says *two-thirds*, ib. p. 497; but this is upon pure limestone, and immediately after it has been calcined, consequently before it can have acquired any moisture from the atmosphere; the more common calculation is therefore about *one-half*, or perhaps *two-fifths*.

Limestone gravel is also an article among our manures which is deserving of consideration. It consists of masses of stones, pebbles, and sometimes of slate and ragstone, resembling a concretion of small stones, or gravel, which, when spread upon the ground and mixed with it, gradually disunites and fertilizes the soil, according as the gravel crumbles down and mixes intimately with it. It is chiefly used on stiff clayey soils, and has been eminently useful in the improvement of boggy and wet bottoms, from which the water had been previously drained. In many such instances it has been found a better and more lasting manure than marl, mellowing and correcting the tenacity of the clay, and producing the white and purple trefoil where sour grass grew before. It is common throughout many parts of Ireland, and in some of the English counties, but it is not generally known in Scotland†.

Fish-Shells.

The *shells of fish*, when burnt, produce the purest species of lime; but they are more commonly employed in a pounded state, in which they may be so advantageonsly used, that oyster-shells, when crushed and drilled upon 27-inch ridges, at the rate of 40 bushels per acre, produced as fine a crop of turnips, as another field of the same land, manured, for the sake of the experiment, at Mr. Coke's, at Holkham, with farm-dung at the rate of 8 tons per acre; nor was there any apparent difference in the succeeding crops of barley and clover. The powder has also been tried at the same farm, for wheat, in competition with rape-dust—both powder and dust at the rate of 4 cwt. per acre, each drilled on a light gravelly loam, in both spring and autumn. The crop was not, in either case, measured, but there was no perceptible difference in either. The field was afterwards sown with turnips, and the produce proved a good crop*. Yet, notwithstanding the result of these experiments, no fair conclusion can be drawn from them regarding their respective effects, as manure, in that sense in which it is understood to mean nutriment; for, although lime may excite the powers of other nutritive matter in the soil, and thus promote vegetation, it possesses no substance, within itself, which can impart nourishment.

In some places these shells are found in large beds almost entire, and they may be then either ground by passing them through the oil-cake crusher, or broken into pieces by repeatedly drawing a heavy stone, or iron roller, over them, when spread upon a floor of flags or clinkers. There is, however, a more economical mode of attaining the same object, which is by merely making them the lower tier of a dunghill, or by spreading them at the bottom of the farm-yard in which the drainage of the urine will decompose them, and in that state the manure will possess all the advantage of a compost with lime†. They may also be used whole on stiff land or clay, on which they act mechanically, opening and loosening the clods, and by that means making way for the roots to penetrate their fibres. To such land they will be found very serviceable, and as they moulder gradually, every year a little, until they are quite spent, they wear down slowly, and their effects, when laid on in sufficient quantity, are long perceptible; but they should not be applied to sandy ground.

On many parts of our coasts, *shell-sand* also forms a valuable species of manure, for the shells which are deposited at the bottom of the sea become there in time decomposed, and the sand which is within reach of the tide, being thrown upon the shore in storms, is, in some places, carted off, and laid upon the land with considerable advantage, though in other parts, the practice seems utterly unknown. Being finely attenuated, it blends intimately with the soil, and thus produces very sensible effects in the correction of cold clays and cohesive loams, on which it is usually laid to the amount of about twenty tons per acre. Its chief value will, however, be proportioned to the quantity of calcareous matter, or of shells, which it contains, and this is in some places found to be so large as nearly to equal the common properties of lime.‡

It is also found in strata, imbedded in sand-cliffs, at the height sometimes of 40 or 50 feet above the level of the sea, in which places it is generally denominated *crag*, and was, no doubt, deposited in former ages, ere the water had receded from the shore.

Lime

Is applied to a great variety of uses: it is employed in medicine as an anti-acid; mortar is composed of it, when combined with sand; and it serves as a manure, which is the only view on which we now have to regard it. When used for the purpose of agriculture, it is formed by exposing the substances we have mentioned to a certain degree of heat in the furnace, or kiln, of the lime-burner. When this has been continued for a sufficient length of time, their weight becomes considerably diminished, though they retain their former shape and bulk; and either limestone or chalk, when thus reduced, is in most places known by the name either of *lime-shells*, or *shell-lime* or simply, *shells*. In this state it is called *quick-lime:* the materials of which it is thus composed possess hardly any active property, but when burned, it then becomes caustic to the tongue, and effects the speedy decomposition of most vegetable and animal bodies. When applied in this form—either in the way of compost, or spread over the soil by itself—it is so far from affording nutriment to anything that may be there growing, that, were its effects to be long continued, it would consume it. But if water be thrown upon it, a great degree of heat is in a short time generated; the burnt shells begin to crack and burst asunder; and the mass gradually crumbles down, or falls, as it is more commonly said, into a fine powder, which becomes white, of whatever color it may have been before it was calcined. Or when it has been exposed for a short time to the influence of the atmosphere, it is also found to lose this caustic power, and it is thus reconverted into a substance of the same mild nature as that from which it was obtained—in all its properties exactly resembling chalk[*].

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* See discription of the mill in his Essays on Agriculture, vol. i. p. 496, 4th edit: also an engraved plan for a similar machine in the Farmer's Magazine, vol. iii. p. 146.

† General Report of Scotland, vol. ii. p. 537; Survey of the County of Dublin, App. p. 17, from Dr. Rutty's Nat. Hist. of the County.

* Extract of a letter from Mr. Blaikie, Steward to Mr. Coke of Holkham, to Sir John Sinclair, dated Sept. 18, 1818.

† Communications to the Board of Agriculture, vol. vi. art. iii.

‡ Survey of Cork, Add., p. 45.

This operation is called *slacking*, or *slaking;* and lime, when deprived of its scorching quality, is termed *slaked-lime*, or, in the language of chemists, *effete*. Instead of watering it in heaps, the practice which generally prevails is to lay the shells upon a fallow, in small hillocks of about a bushel and a half each, either thrown up around the circumference of each heap, or covered up immediately with some fresh soil made very fine, which, when laid on moderately thick, should be clapped close down with the back of the spade, so as to exclude the admission of either air or rain. In this state it may remain for a few days, care being taken during that time to keep every part of the heaps tight and sound, when it will be found that the moisture of the earth will have completely slaked it. Although it may be thought that this covering of the lime is unnecessary, it yet has this use—that without it the rain would form crusts over the heaps, which would not only prevent the moisture from penetrating regularly through them, but would also hinder them from being pulverized without considerable difficulty. It will then be fit for use: and when spread over the field, it should be immediately ploughed in with a shallow furrow, and well stirred with the harrows in every direction. Upon an 18-feet ridge these heaps will be the same distance, or 6 yards, asunder, from centre to centre, if about 200 bushels be laid on per acre; and so on when other quantities are applied. Instead of slaking the lime in this manner, it has however been recommended to lay it down in a long heap, or mound, on one side of the field on which it is to be applied. Two laborers are then employed to turn the mound, and a third waters it. When the whole has been thus gone over, it is allowed to lie for four or five days, after which it is again turned, and if any part of the lime should be found to be still unslaked, more water is added[*].

From this it will be perceived, that one chief cause which renders the burning of lime necessary, arises from the extreme difficulty of obtaining the powder without the process of grinding; but by being thus more finely divided, it can also be more evenly diffused over the soil, with which, therefore, it becomes more evenly mixed, and more prompt in its effects upon the land; and when laid upon it in its hot state, it not only occasions the destruction of weeds, but powerfully stimulates the action of manure. An idea, indeed, generally prevails, in consequence of burning being the mode usually resorted to in the employment of lime, that calcination is necessary to render it fit for use as manure; but this, as we have already remarked, is a mere mistake.

One very strong reason for applying it instantly is, that, if spread immediately after being turned, and while yet in a powdery and caustic state, a smaller quantity may suffice to cover the whole surface of the ground, and to come into contact with more minute particles of the soil; whereas, if suffered to lie for any length of time exposed to the atmosphere, it imbibes so much moisture, that it runs into clods, and can never again be so equally divided into small parts; wherefore a much larger quantity is required to produce the same immediate effect. It is in this state, also, that it acts the most powerfully upon all organic matter which may be already lying undecomposed within the soil—insects, the fibres and roots of obnoxious plants, and the seeds of weeds—which it dissolves and transforms into mould. It is also more efficacious than effete lime in its influence upon what is called *sour land;* though simple chalk, if applied in large quantities, will correct the evil. Neither is it improbable that, during its process of slaking, the heat which it generates by the absorption of moisture causes it to swell in a manner which the tenacity of the soil cannot resist: thus producing fermentation, it not only eventually makes the land mellow, but renders matter which was comparatively inert, nutritive, and is probably more beneficial to land containing much woody fibre, or animal fibrous matter, than any calcareous substance in its natural state[†]. If, therefore, quick-lime really possesses superior qualities as a manure, it seems only fair to infer, that the greater the strength and vigor of such properties, the more assuredly will they effect its purpose when in that state, than after it has been rendered effete.

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[*] See Hornby on Lime, p. 10; Dr. Anderson's Essays relating to Agriculture, vol. i. Essay vi.; and Sir Humphry Davy, Lect. vii. When moistened with sea-water, lime yields more alkali (soda) than when treated with common water; and is said to have been used in some cases with more benefit as manure—Ibid., p. 298.

[*] Library of Useful Knowledge: Farmer's Series, No. 18,—Report of a Farm in Ross-shire. Malcolm's Survey of Surrey, Kent, and Sussex, vol. ii. p. 46; Papers cf the Bath Society, vol. ii. art. xxviii.

[†] In its *first effect*, burnt lime decomposes animal matter and seems to accelerate its progress to a capacity of affording nutriment to vegetables: gradually, however, the lime is neutralized by carbonic acid, and converted into a substance analogous to chalk; but in this case it more perfectly mixes with the other ingredients of the soil, and is more pervadingly diffused, more finely divided, than mere chalk artificially applied. Sir Humphry Davy, Elem. of Agric., Chem., lect. vii.

Considerable judgment is however requisite in this mode of its application; for, although it promotes putrefaction, and converts the pulp, or saponaceous substance, of vegetable matter into the food of plants, yet, if too great a portion of lime be added, it may have a contrary effect, and it always destroys, to a certain extent, the efficacy of animal manures, either by combining with certain of their elements, or by giving to them some new arrangement. It is necessary to the reduction of carrion, or for qualifying the noxious effluvia of night-soil; but is so injurious when mixed with any common dung, that it tends to render the extractive matter insoluble*: thus if a sufficient quantity of quick-lime be added to a heap of stable-dung in a state of fermentation, it will set it on fire, and the whole will be consumed. It should never, therefore, be mixed with farm-yard manure, unless a small quantity be found absolutely necessary for the prompt destruction of seed-weeds, or the decomposition of roots; but when laid upon the land during the same season, the dung should be ploughed down alone, and the lime afterwards harrowed in with the seed-furrow. It may, indeed, be observed, that the dung dropped from horses in their work about kilns is usually so completely destroyed by the lime which falls from the carts in filling, that it is generally found useless to apply it to the land. It also consumes the growing herbage; but, if prudently used, it does not appear to reach the roots, as a fresh verdure soon after arises, and seeds which had previously lain dormant in the soil are brought into action‡.

By neutralizing the acids combined with the mould, this manure qualifies the vegetable and other soluble substances also present in it, and occasions the whole to be converted, by the influence of the atmosphere and of water, into nutriment for plants; but in poor soils, having less vegetable matter to convert into mucilage, it acts so powerfully as not only to exhaust such land by its final effects, but to be prejudicial to the immediate crops§. We have, indeed, the opinion of a very experienced farmer, who is also well versed in chemistry, 'that, should much rain immediately succeed the ploughing, and any considerable portion of sand be either in the lime, or in the soil, it is almost a moral certainty that such soil will be in a worse state than it was before the lime was put on; because, the moisture being retained by the lime and the soil, and the tenacity of the substratum not suffering the superabundance to pass quickly away, it causes the whole to run together, and form a compact and impervious bottom, which before, however, might have been pervious in a slow degree. That this must be the case is evident from this consideration—that quicklime, mixed with a certain portion of sand, and duly moistened, contracts and forms a substance which we call mortar, or cement; in proportion, therefore, as the quality of these materials is more or less perfect, so does the substance become more or less compact, hard, solid, and impervious: such must be the condition of the soil; and it is but reasonable to suppose that a great part of the seed sown upon it must perish*.'

It may indeed be alleged that the caustic action of quick-lime can never be exerted to any great extent, as it attracts fixed air too strongly not to become immediately slaked; but its effects are found to be powerful even in that short period, provided that it be promptly and intimately mixed with the soil, for though the land should contain an abundance of vegetable matter, yet if it has been injudiciously cropped, or insufficiently manured, the lime will only add to its infertility.

As the dust of quick-lime is prejudicial to health, care should be taken by those who spread it over the land to work upon the windward side. Precaution should also be used, when it is ploughed in immediately after being spread, to do so when the soil is quite dry, as well also as to prevent the horses from passing through any wet places when going to field; for though the powder of dry lime, when in a caustic state, does not take any apparent effect on the skin, and the hands of a person who has wrought in it are not in the least injured, yet it very soon corrodes the hair and flesh, if it has access to water, and horses have been thus irrecoverably lamed. When unharnessed, they should, therefore, be kept dry until thoroughly brushed over, so to completely remove the dust which may adhere to their coats, and more particularly to their feet and legs. They may thus work without any danger; but, in case of accident happening to either men or horses through being scalded by the lime, the part affected should be immediately washed, either with vinegar or with very sour milk, by which its irritation will be prevented. After the lime has been slaked, it will become effete in about a week, and will then be as little corrosive as any common kind of earth; so that the horses may work among it with entire safety: but if it has been suffered to run into clods before it was spread, these, if not broken into small pieces, will be longer in absorbing a sufficient portion of air, and therefore will remain longer in an acrid state, so that the ploughing will be better deferred for another week, or even longer*.

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*Sir Humphrey Davy, Elem. of Agric. Chem., 4to., p. 280.

‡ A circumstance has been related of mild and quick lime having been separately laid upon land, with the following effect:—the spot upon which the former was laid was soon covered with white clover, but on that on which the latter was left, no vegetation whatever took place for a considerable time, when it at length produced couch-grass, which is accounted for by the hot lime having retained its causticity so long as to have entirely destroyed the seeds of the clover, which are generally diffused in calcareous soils, and consequently flourish through the application of mild lime; while those of the couch were either more difficult to eradicate, or were spread from the adjoining land.—Sinclair's Code of Agric., 3rd edit., note p. 235.

§ 'All the experiments yet made render it probable that the food of plants, as it is taken up from the soil, is imbibed by the extremities of the roots only.—Hence, as the extremities of the roots contain no visible opening, we may conclude that the food which they imbibe must be in a state of solution at first; and in fact, the carbonaceous matter in all active manure, is in such a state of combination as to be soluble in water whenever a beneficial effect is obtained.—Dr. Thomas Thompson's Chemistry, 3rd edit., vol. v. p. 376.

* Malcolm's Survey of Surrey and the Neighboring Counties, vol. ii. p. 41—43.

When quick-lime has been deprived of its causticity, it is called by chemists *carbonate of lime*, and in that mild state it does not act upon animal or vegetable matter with the same violence as quick-lime, but instead of dissipating any portion of the substance which may be contained in the soil, it facilitates its reduction into that state by which it the most effectually assists vegetation. Neither has it the same tendency to combine, as it were into a mortar, with the sand of poor clays.

Lime, however, *whether quick or slaked*, when used by itself, without any addition of earth, is not possessed of any vegetative quality: thus, 'seeds planted in a flower-pot filled with powdered carbonate of lime, regularly watered, vegetated feebly, made little progress, and died without coming to perfection; but when partly filled with garden-mould, and carbonate of lime 1½ inches thick over it, the plants put down their radicles straight through the lime, without ramifying or stretching sideways, till they arrived at the mould. Even in a mixture where lime was only one-fifth, the plants were poor and sickly, and made no progress; and when quick, it, with the aid of water, suddenly destroys all vegetable substance.'† It may even be hurtful to vegetation when laid in too large a quantity upon very light and warm soils; for, by quickening evaporation, it dries the land too much, by which means, plants are deprived of the moisture necessary to their sustenance; therefore it is, that calcareous earths are frequently known by farmers as 'burning soils;' and, by its injudicious use or repetition, without the aid of animal or vegetable manure to supply the nourishment of which they have been deprived by crops, the growth of which has been thus forced, land, though of superior quality, may at length become exhausted.‡ Thus experience teaches that lime, when applied to land, has different effects upon some soils than it has upon others: on many there is a rapid and permanent improvement, on others there is less benefit, and on some it is said rather to retard than to promote vegetation. This is no doubt chiefly influenced by various unascertained properties in the soil, and partly also by difference in the qualities of the lime itself, arising from its mixture with other earths.

Whether it possesses any further properties, through the stimulating effects of light and heat upon the vegetable fibre, has been conjectured, but has not been supported by any positive fact, and seems to be contradicted by the slow effect of effete lime in its operation upon the soil. It is, however, worthy of remark, that calcareous earth is found in the ashes of all vegetables; that it is present in a larger proportion in wheat, clover, and some other plants whose growth is especially promoted by the use of calcareous manures, and many are said not to ripen in ground in which it is entirely wanting.* We may therefore conclude that it is of the highest importance in the process of vegetation, and that an accurate investigation of its mode of action, by enabling us to judge with more certainty of its powers, would greatly tend to the improvement of agriculture. It is indeed much to be regretted that the subject has not been more fully investigated, and that some more definite judgment has not been framed regarding the properties of lime, the effects of which in its application to the soil are exposed to the most contradictory results. Much money has thus been uselessly expended, and labor thrown away, which, under better information, might have been saved; and without scientific analyses of the component parts both of soils and of lime, we remain much in the dark regarding their effects on vegetation; but, judging from the faint lights with which we have been furnished, we shall still endeavor, by comparing science with practice, to obtain such instruction as may guide us to an economical and useful application of this manure to field culture.

Application of Lime.

Those purposes appear to be—first, to render whatever substances may be lodged in the soil, or matter which forms part of it, and which may be injurious to vegetation, either harmless or useful; and thus to prepare the soil for the reception and nourishment of seeds and plants: and secondly, to facilitate the decomposition of putrescible matter, so as to furnish food to vegetables during their growth. It has been proved by careful experiment, that the application of lime is the only known alterative which, upon poor, weak, and weeping clays, has power to heal the soil. With the assistance of water, it suddenly decomposes all animal and vegetable bodies, and when thus spread upon neglected ground covered with heath and moss, the old turf is decomposed, and a saponaceous matter is formed, which sinks into the soil and covers it with sweet herbage. We also know that it imparts a certain degree of vigor to some peculiar plants,—as, for instance, sainfoin, the roots of which penetrate far into the interstices of chalk, and grow luxuriantly, though only covered by a slight coat of inferior soil.†

It is however an error, though entertained by many farmers,—to suppose that lime in any state comprizes fertilizing properties within itself; and that, without operating upon the soil, or upon the substances which it contains, it is an enriching manure. It does not possess any fertilizing principle in its own composition; it is merely a calcareous earth combined with fixed air, and holding a medium between sand and clay, which, in some measure, remedies the deficiencies of both. But though, when alone, unfavorable to the growth of plants, yet experience shows that it is an ingredient in soils which, whether naturally forming a component part of their substance, or judiciously mixed with them by the husbandman, adds greatly to their fertility, for it has the power of attracting much both from the earth and from the air, which occasions the decomposition of plants, and thus converting them into nutriment, it gives power as to vegetation which, without its operation, would otherwise lie dormant. It also appears to act with great force upon that substance which, being already converted by the decomposition of plants into a species of earth, we call *mould.*

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*Andersons's Essays, vol. i. Essay vi. part ii.; Malcolm's Survey of Surrey, Kent, &c., vol. ii. p. 58; Theaër, Principes Raisonnés d'Agriculture, vol. ii. p. 392.

†Naismith's Essay on Manures in vol. ii. of the Appendix to the General Report of Scotland, chap. xii. p. 89.

‡Gyllenborg's Chemical Treatise on Agriculture; Pilkington's Trans., chap. x. sect. viii.

* Malcolm's Comp. of Agric., vol. p. 57; Anderson Essays, vol. i.

† See Naismith's Elements of Agriculture p. 334. Thaër, Principes Raisonnés d'Agriculture, 2nde edit., tome ii. p. 387; and Anderson's Essays, No. vi., part 2, Aphorism iv., in which it is stated, that calcareous matters act as powerfully upon land that is naturally poor, as upon land that is more richly impregnated with those substances which tend to produce a luxuriant vegetation.

The other causes with which we are acquainted regarding the operation of lime as a manure, would lead to a chemical discussion, which could only prove uninteresting to the generality of our readers; we shall therefore confine ourselves to the following observations. There can be no doubt that it is a most powerful stimulant when applied to deep loams and heavy clays, which contain mould of a nature so sour as to appear to unfit them for the purposes of vegetation; or to land which has been previously either more or less manured with animal or vegetable substances, without any addition of lime or other calcareous matter, in which case it often produces effects far more fertilizing than the application of dung, for its active powers render every particle of the putrescent manure useful; but if the latter be not afterwards repeated at no great distance of time, the soil will, in the couse of a few years, become considerably exhausted. In all arable land, however impoverished it may be, either by nature or bad management, there yet always exists some portion of mould, and, on this, a first dressing of lime occasions a sensible improvement of the soil, which soon becomes apparent in the increased product of the crops. A second dressing will also be attended with some apparently good effect; but unless that, and every succeeding repetition, be accompanied with ample additions of farm-yard manure, or other putrescent matter, to supply the loss thus occasioned by the exhaustion of the vegetative power, every future crop will be diminished. The land is then necessarily thrown out of cultivation, and left for a series of years to recover itself under pasture, which, in the course of time, may be effected according to its former condition; but in the interim it is rendered nearly fruitless. It is thus that many thousands of acres in every part of the kingdom have been run to a state of almost total infertility; and it is even said, that the too great use of lime, though apparently judiciously employed, by some of the first farmers in the Lothians, has been lately found very detrimental to their crops.

Marsh lands, however, which have been drained, will generally support a repeated and abundant application of lime, because they usually contain a large proportion of matter upon which the stimulating powers of lime are peculiarly adapted to act; and it will be found much better suited to the purpose than dung. On all rich, deep, dry, and loamy soils it may also be applied with effect; for although they contain within themselves the component parts of the best soils, yet they are frequently found to be sluggish and inert; and dung, whether through imperfect fermentation or owing to the want of calcareous matter, often remains dormant in the land until roused by moderate quantities of quick-lime, which, if applied at distant periods, will effectually operate to bring it into activity. It should, however, be turned into the ground some weeks before the dung, in order that it may become thoroughly slaked by mixture with the soil, or otherwise it would have the effect of abstracting some of its nutriment. Such soils, after the application of lime, produce much heavier crops with a much smaller proportion of dung than if no lime had been used, because the operation of the latter acting upon the dung renders every portion of it useful.

Clay land shows an evident disposition to combine with lime, and it bears the repetition of this species of amelioration better than lighter soils. When applied to heavy tillage land, either for the purpose of reducing its cohesive properties, or of supplying an additional quantity of calcareous matter, small dressings of lime will have but little effect; and if sand or calcareous earths are to be employed, it is recommended, by a practical farmer of known experience, as more economical to apply them separately than as a compost.* It powerfully assists all adhesive soils; and when laid hot from the kiln upon deep clay, it has been known to occasion a very large increase in the former crops. It has also been often observed, in fallowing clayey soils, 'that, in wet weather, when a dose of lime has been just given, the land continues more friable, and is less apt to bind up on the recurrence of drought than where it has been neglected. The grain growing on the well-limed ground preserves its healthy appearance in wet seasons, while that growing on land that has not been limed is yellow and sickly.'†

Upon *sandy soils,* which seldom abound much in vegetable matter, lime has a mechanical operation, which, by combining with the finer particles of the soil, gives consistence to the staple of the land, and attracting the moisture from the atmosphere, it imparts it so gradually as to be less liable to be hurt by drought in those parching seasons by which crops are injured. It is therefore said to be cooling to hot land; but if it be not also mixed with some portion of clay, with which it may combine, it then is apt to unite itself with the sand, with which it composes a kind of mortar, the effect of which has been already described, and which cannot be dissolved without much difficulty, and the plough often brings hard lumps to the surface of the soil which cannot be easily broken. Thus when such land has been frequently limed, nothing can restore it but the abundant and reiterated application of putrescent manure; the demonstration of which is perceptible throughout many parts of England, where from possessing a chalky soil without strength to maintain a sufficiency of live stock to furnish dung, the land has in many places been worn out through the inconsiderate use of lime.

On the *exhaustion of land by the application of lime* there is, however, much difference of opinion. It is indeed evident that the continuation of cropping, without an addition of nutritive manure, will ultimately exhaust the best soils; but though their natural fertility be thus aided, it yet cannot depend entirely on that support. This must be apparent if we reflect that land, without any addition of animal or vegetable substance, will still produce crops:

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* Russell's Pract. and Chem. Agr,

† Library of Useful Knowledge Farmer's Series, No. 12, Report of a Farm at Kyle, in Ayrshire.

for pure sand, clay, and chalk, though each in themselves separately barren, yet, when mixed together, exert chemical influences upon each other, which, by the attraction of the air, the dews, and the rain, the force of the sun, and the generative powers of growing vegetables, effect the production of corn and fruit. It is therefore clear that the land alone is capable of vegetation; but every day's experience proves that the amount of its products, its fertility, in short, depends in a great degree upon the decomposition of the substances which have been previously converted into vegetable mould, or which are added to it by manure. Any thing whatever may be called manure, which, when applied to the soil, either rectifies its mechanical defects, corrects any bad quality, and either stimulates it to yield, or stores it with nutriment. Thus, if lime be laid upon pure sand, although the latter would be rendered more tenacious, and would thereby become more favorable to the germination of vegetables, yet seeds could find no nourishment from either the lime or the sand; and putrescent manure would still be necessary to produce a crop. But if the soil consist of clay and sand, containing animal or vegetable matter in a torpid state of decay, then lime would be preferable to dung. The state of the soil should therefore be minutely inquired into before lime is employed; and it should be only used to give effect to the inert substances with which it may be combined.*

By the analysis of soils, we find that all productive earth contains a certain portion of lime; and although we learn from experience that its stimulative powers upon the roots of plants are very great, yet we are but imperfectly acquainted with the extent or the exact manner in which its influence is brought into action, and 'we are in a great measure ignorant of the actual changes that are produced upon the earth after this manure has been applied.'† It would however, seem that, where it exhausts, it is only by hastening the putrefaction of the animal and vegetable matter in the soil, and by that means applying a larger portion of those substances in a given time than could be otherwise afforded to the growth of plants. It is thus known to produce more luxuriant crops, and it will also consequently enable the farmer to continue his land in tillage, during a certain time, with more effect than if no calcareous manure had been laid on; but, although it may not tend to the deterioration of the original staple of the soil, it can hardly be doubted that it must be thus more promptly deprived of its fertility than if the exhaustion of that vegetable mould with which it had been supplied by nutritive manure were occasioned by a more gradual process of decomposition.

That this is the only way in which effete lime can exhaust land, seems probable from the large quantities of neutralized calcareous earth which are often applied without any bad effect in the form of chalk, shells, limestone-gravel, and the whole tribe of marls. A larger quantity of these is oftener laid on in one year than would be used of lime in half a century, were the land in tillage to be managed according to the custom of some countries; yet it is not generally impoverished, and, in many cases, it is permanently improved. This, however, is probably occasioned by its combination with other substances, which either counteract its exhausting powers or supply the waste of nutritive matter. It must, however, be admitted, that this is not apparent in regard to chalk, which is commonly applied in large quantities without any bad effects, and there are many instances of soils more naturally fertile than perhaps any others that are known, and which seem to consist almost wholly of calcareous earth;* but were their properties critically analyzed, it is still possible that they might be found essentially different from those which they are commonly supposed to possess.

A very eminent writer on agriculture, when treating of stimulant manures, which are generally supposed to be only of use when applied to rich soils, and when applied to poor land would produce hardly any, or even hurtful effects, says, in contradiction to that theory—that 'he is firmly convinced, from repeated observations, that lime and other calcareous manures produce a much greater *proportional* improvement upon poor soils than on such as are richer: and that lime alone upon a poor soil will, in many cases, produce a much greater and more lasting degree of fertility than dung alone.'† That, however, does not throw any doubt on the assertion, that it acts with as great *proportionate* power upon land that is naturally poor, as upon that which is more fully impregnated with those substances which tend to promote a luxuriant vegetation; but we believe that the experience of farmers will prove that its application to poor land, and especially to that which has been previously limed, if it does not eventually tend to its complete exhaustion, will at least never be found to repay the expense.

The employment of lime seems to be of the greatest service in the *breaking up of fresh and coarse land*, on which it acts more powerfully than on soil which has been long in cultivation; and indeed the most striking improvements have been effected by its means on moorlands and mountain; but it should be given for the first time abundantly. Such is the usual effect of lime upon arable: upon *grass-land* it is laid in smaller quantities; and in this top-dressing, perhaps the preferable mode is to apply it in a compost with earth; except when the soil consists of clay. When thus spread upon the surface, its action upon the sward is productive of the most palpable improvement, and continues perceptible during a long period. No other manure will create so rapid a change; for it is such an excellent corrector of acidity, that it tends to produce the sweetest herbage where only the most unpalatable pasture was formerly to be found. This, indeed, is so apparent, that if a handful of lime be thrown upon a tuft of rank, sour grass, which has in former years been invariably refused by cattle, they will afterwards eat it close down. Now, animal dung, when dropped upon coarse benty sward, produces little or no improvement, until limed; it then, however, not only augments the crops, but the finer grasses continue in possession of the soil, and the land is thus doubly benefited; for the dung dropped by the stock on which it is pastured, is both increased in quantity, and improved in quality.[*] Farmers should never consider lime as the food or nourishment of plants, but as an alterative of the soil; never to be used but when nature requires it, either to dissolve noxious combinations, and to form new ones; to bind loose soils, or to diminish excessive cohesion; and to reduce the inactive vegetable fibre into a fertile mould. For such purposes there is not, perhaps, a more valuable article in the whole catalogue of agricultural remedies; but some farmers, who do not reflect upon the subject, when they perceive that lime has once excited the dormant powers of the soil into action, and that good crops succeed for a few years, are apt to draw from thence very false conclusions, and continue liming and tilling without the assistance of putrescent manure, until their land at length is rendered incapable of the production of corn. It has indeed been pertinently observed by a good judge of such matters, 'that there is an analogy between the treatment suitable to the animal and vegetable creation. When medicines have removed the cause of their application, they are discontinued, and the patient, rendered weaker by the application, requires some invigorating aliment: in like manner, some time after an effectual liming, the soluble carbon of the rotten dung, or some such restorative, should be applied to the soil to replenish it with what it may have been robbed of by the action of the lime.'[†]

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* Finlayson's Practical Essays on Agriculture, 2d edit., p. 111; Bland on the Principles of Agriculture, chap. iv.

† Anderson's Essays on Agriculture, 4th edit. vol. i. p. 526.

* Malcolm on the Agriculture of Surrey, Kent, and Sussex, vol. ii. p. 55. Marshall's Midland Counties, vol. ii. Minute 100.

† Anderson's Essays on Agriculture, vol. i. p. 569.

In fine, lime should always precede putrescent manures when breaking up old leys for cultivation, for, if the land contains acids, or noxious matter that is poisonous to plants, they will be decomposed and rendered fit for vegetation; and hence the superiority of lime to dung on new lands. But calcareous and putrescent manures operate very differently: 'the former, being more stimulant and corrective, help the farmer to an abundant crop at the expense of the soil alone; while the latter furnish the land at once with fertilizing fluids, and will insure a good crop on a place perfectly barren before, and after the application of lime.'[‡]

Much uncertainty prevails among farmers *regarding the state of lime:* some contending that it should only be applied when hot and powdered, and that when it has been slaked, its effect is comparatively trifling; others maintain the contrary. But these disputants consist chiefly of men whose experience has either been confined to one kind of soil, or who have only used it under particular circumstances, and as they only condemn the system of others because their own has turned out successful, or the reverse, it is not improbable that, in the view they take of the subject, each may be in the right. It will therefore probably be found, that in all cases where the land is constitutionally disposed to receive benefit from a calcareous dressing, that is to say, when it has not been previously limed, or when it has been long laid down and refreshed by grass, or enriched by the application of dung, it is of little importance whether the operation take place when the lime is quick or effete. Upon waste lands, however, its causticity has an evident and necessary effect; for the undecayed vegetables, which abound in all soils in a state of nature, should be speedily decomposed, and it should therefore be spread hot from the kiln. In point of economy, too, there can be no doubt but that it is most thriftily used when laid upon the land in the latter state: for the labor is less; and a smaller quantity will serve the immediate purpose. It is, however, obvious that the choice of circumstances and season is not always in the farmer's power; and that necessity often obliges him to lay it on when completely effete. It has been said, indeed, upon high authority, that caustic lime exhausts the land; but repeated trials have shown that its ultimate effects are equally beneficial in the one state or the other, though there is a more immediate advantage in the employment of quicklime by the destruction of weeds. A common method is to leave it spread during some months upon clover or sainfoin, not intended to be broken up until the following year—a plan which is advisable with regard to marl, which partakes of some of the qualities of lime, and is the better if allowed to remain during a season exposed to the atmosphere; but the stimulating properties of quicklime will be thereby lost, as it will be converted into mere chalk. Opinions are also much divided respecting its effects when laid upon pasture land which is intended to be kept in grass. There is indeed no question that, in either state, if applied in moderate quantities to a dry soil, or to land that has been completely drained, such a top-dressing will have the most beneficial effect upon the herbage; but it must be admitted, that when laid on quick, it requires more circumspection in its application, and should not be employed in the same quantity as when effete.[*]

We learn, from the General Report of Scotland, that there, 'in the best cultivated counties, lime is now most generally laid on finely pulverized land, while under a fallow, or immediately after being sown with turnips. In the latter case, the lime is uniformly mild: in the former, quicklime, as pernicious (in a certain extent) to vegetation, may be beneficial in destroying weeds; and some experiments have been recorded, showing it to have a very powerful effect upon the fly, to which we shall find future occasion to advert. Sometimes mild lime is applied in the spring to land, and harrowed in with grass-seeds, instead of being covered with the plough; and under this management a minute quantity has produced a striking and permanent improvement in some of the hill-pastures of the south-eastern counties. Its effects are yet perspicuous, after the lapse of nearly half a century. In some places lime is spread on grass-land a year or more before it is brought under the plough, by which the pasture in the first instance, and the cultivated crops subsequently, are found to be greatly benefited. But in whatever manner this powerful stimulant is applied, the soil should never be afterwards exhausted by a succession of grain-bearing crops—a justly-exploded practice, which has reduced some naturally fertile tracts to a state of almost irremediable sterility.'

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[*] In Derbyshire the farmers have found that, by spreading lime in considerable quantities upon the surface of their heathy moors, after a few times the heath disappears, and the whole surface becomes covered with a fine pile of grass, consisting of white clover and the other valuable sorts of pasture-grasses. Anderson's Essays, 4th edit., vol. i. p. 527. Survey of Derby, vol. ii. p. 487; and of Westmoreland, p. 235.

[†] Walter Davis, Survey of North Wales, p. 308.

[‡] Finlayson's Practical Essays on Agriculture, 2nd edit., p. 112.

[*] Essay on Manures, by Arthur Young, in the Papers of the Bath Agricultural Society, vol. x. p. 119. Farmer's Magazine, vol. iii. p. 77. Thaër, Principes Raisonnés d'Agriculture, 2de edit., tom. ii. pp. 388, 399.

To point out the precise effects of lime, and the proper quantity to be applied, to the extent to which it has been already ascertained, would greatly exceed the limits of this publication; and were it possible to define its powers upon every gradation of soil, a series of experiments would be required which would occupy the labor of a long life. Its qualities, too, differ materially in various places, from the greater or less quantities of extraneous substances with which it is combined. It is very rarely that any farmer can obtain a choice of lime, and when only one species can be procured he must be content with it; but he may, nevertheless, be benefited by the following observations.

Qualities and quantity of lime.

Pure limestone, or *chalk*, when fully calcined, is reduced to a fine impalpable powder, that feels soft within the fingers, without the smallest tendency to grittiness: but such lime as contains sand is neither so soft nor fine, but feels more or less gritty in proportion as the sand is coarser or finer, and more or less in proportion. Commonly, the whitest lime is the best; when perfectly calcined, it is generally of a bright white, without any shade of color, and if clouded, it is thought to proceed from a mixture of other matter; but the color is not an infallible criterion, for dark colored lime has, in some few instances, been found stronger than that which was perfectly white. The purer and the stronger the lime is, the lighter also it will be found when weighed. Hence it follows, that the best lime for the farmer's use is that which is the softest to the touch, the whitest, and the lightest.

The other simple tests for ascertaining its quality, which will be found sufficient to decide upon the comparative value of any two kinds of lime, and may be relied upon as sufficiently accurate for the common purposes of the farmer, are as follows:—if the limestone loses much of its weight in calcination, and the lime-shells are extremely light—if the shells require a very large proportion of water to slake them fully—if it is long before they begin to fall—if the limestone is not apt to *run* (or to become vitrified) in the operation of burning—if it falls entirely when it gets a sufficient quantity of water, after it has been properly calcined—if it swells very much in slaking, and if the lime is light, fine to the touch, and of a pure white—he may be satisfied that it is extremely good, and he may use it in preference to other lime that is inferior to it in any of these respects. The presence of lime may also be discovered by its effervescence, or ebullition, on being exposed to common vinegar.*

When quick-lime, too, is completely sifted through a fine hair-cloth, that is the strongest which leaves upon the cloth specifically the smallest of earthy or sandy particles; and that, also, of which the smallest quantity, when spread upon the same space of ground in soils of equal quality, will the soonest burn up the surface of the grass. We may also add, upon the authority of Sir Humphry Davy, that lime, when slaked with sea-water, has been used in some cases with considerably more benefit than when wetted in the common manner.

The benefit which might be derived from the union of a slight portion of chemical skill with agricultural knowledge is perhaps incalculable. The present state of education among the generality of farmers is not such, however, as to enable them to reap much advantage from scientific experiments, and even chemists rarely have opportunities of applying their art to practical purposes of this kind. It may, however, prove useful to some to offer a few brief directions for the analysis of lime, which we extract from the recent work of Dr. Henry:—

'To determine the purity of lime, let a given weight be dissolved in diluted muriatic acid. Let a little excess of acid be added, that no portion may remain undissolved owing the deficiency of the solvent. Dilute with distilled water; let the insoluble part, if any, subside, and the clear liquor be decanted. Wash the sediment with further portions of water, and pour it upon a filter, previously weighed. Dry the filter, and ascertain its increase of weight, which will indicate how much insoluble matter the quantity of lime submitted to experiment contained. It is easy to judge, by the external qualities of the insoluble portion, whether argillaceous earth abounds in its composition*.'

The presence of *magnesia* in limestone has been considered pernicious to vegetation when burnt into lime. It had been long known to farmers in the neighborhood of Doncaster, and other parts of Yorkshire, Derby and Nottingham, that lime made from a peculiar species of limestone injured their crops, and that made from the Breedon limestone, in Leicestershire, which there goes under the denomination of 'hot lime,' is so powerful, that it is there seldom used in larger quantities than from 25 to 30 bushels an acre, unless the land be very rich. A series of experiments were made upon the former by Mr. Tennant, who discovered that it contained magnesia, and on mixing some calcined pure magnesia with earth, in which he sowed different kinds of seeds, he found that they either died or vegetated very imperfectly; he therefore came to the conclusion that its effects were prejudicial. This is thought to have been occasioned by its retaining its caustic quality longer than pure lime; and that, if used to excess, it has a poisonous effect on vegetables, though, 'on poor soils,' it has been said, neither to receive water so rapidly, nor to part with it so freely, as lime;

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*More detailed information on the mode of pursuing experiments on lime may be obtained from Anderson's Essays, Essay vi. part ii. sect. 11, 12 and 13, p. 88, from the substance of which the foregoing is chiefly extracted. Our farming readers will also find an ample discussion regarding the analysis of lime, in the following volumes of the Farmer's Magazine, v. pp. 27, 265, 451; vi. pp. 11, 192, 312, 316; vii. pp. 26, 83, and in Sir Humphry Davy's 7th lecture.

* Elements of Experimental Chemistry, 10th edit., vol. ii. chap. xv. sect. iii.

and in this respect it seems to hold an intermediate property between lime and clay*.' Experiments have also been made by Sir Humphry Davy and other chemists, from which it may be collected that, although, when calcined, as lime, it may become pernicious to land, if laid on in too large quantities, yet that, in its mild state, it is a useful constituent of soils. One of the most fertile parts of Cornwall, in the neighborhood of the Lizard, is a district in which the land abounds in magnesian earth. It is, indeed, one of the mildest absorbents with which we are acquainted, and upon ground which is infested with sorrel, its application is an immediate remedy. Magnesian limestone is usually of a pale yellow or brown color, and is found in many parts of England, as well as Ireland: it effervesces when plunged in acid, though it only dissolves slowly.

Its analysis requires a process too tedious to be here stated, but its existence in lime, in a pure state, may be ascertained by the following test:

Having taken out all the mineral oxide, next pour into the fluid a solution of neutralized carbonate of potassa, continuing to do so until it will effervesce no longer, and until both the test and smell of the mixture indicate an excess of alkaline salt. The precipitate that falls down is carbonate of lime: it must be collected on the filter, and dried at a heat below that of redness.

The remaining fluid must then be boiled for a quarter of an hour, when the magnesia, if any exist, will be thrown down combined with carbonic acid.

The *quantity of lime* to be applied to the land must of course be apportioned to the quality of the former, as well as to the nature and the condition of the soil: which considerations must also be in a great degree governed by the expense. There is perhaps no country where it has been used to such an extent as in the improved parts of Scotland, where it is often carried to the distance of twenty to thirty miles, after having been imported from distant points of the coast, and even from Ireland; and although it has been laid on at prices, varying in proportion to its strength, and the charge of burning, from 6s. to 18s. per chaldron of 36 bushels†, besides the cost of carriage, and in quantities according to the nature of the soil, yet the improvement has, in most places of its first application, borne out the charge‡. In Ireland, Chief Baron Foster has gone so far as 300 barrels, with manifest good effect. It is in that country, indeed, not uncommonly applied at the rate of 400 bushels per imperial acre; and immense crops of potatoes have been raised by its being laid upon strong old leys broken up in July or August, and allowed to remain in that state until ploughed again in the spring. It has been laid on some of the moors in Derbyshire to the amount of 1500 bushels§. Dr. Anderson says that 'he has himself had experience of it in all proportions, from 100 to above 700 bushels to the acre, upon a great variety of soils; and that he always found its effects in promoting the fertility of the soil to have been in proportion to the quantity employed, other circumstances being alike||; yet an instance is mentioned, in the Nottingham Report, of twenty chaldrons, or 720 bushels, having been laid upon an acre of cold clay soil, without any benefit whatever. Experiments have also been tried of its application on heavy lands extremely retentive of moisture, to the extent of 300, 450, and 550 bushels, which, after eight scccessive years, showed no perceptible difference arising from the quantity laid on¶, and similar instances are too numerous to require mention; but these failures may, not improbably, have been occasioned by the imperfect state of the drainage. Lime has, however, been on so many occasions used at random, without inquiry being made or attention paid to the state of the land,—whether it has been over-cropped and worn out, or has been left under pasture and enriched by dung,—that, without regard to these particulars, much money has been uselessly expended, and many attempts at improvement have been rendered unsuccessful. A system also prevails in the cultivation of many estates in various parts of the kingdom, under which the tenants are bound by their leases to fallow the land at fixed periods, and to dress the fallows with a certain quantity of lime*; which being thus repeated when the condition of the ground does not always require it, it necessarily follows that no beneficial result can be attained.

Such, indeed, is the variety of soils and circumstances, that no general rule can be devised for fixing the quantity of lime that may be properly laid upon an acre of land. The various accounts from the different county surveys, and other sources of

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* Russell's Practical and Chemical Agriculture p. 37.

† Sir J. Sinclair states the average throughout Scotland at *6d.* per bushel. Code of Agric., 3rd edit., p. 232: but excellent lime, made from chalk, can be delivered at the wharfs in London at *4d.*, or, if made out of limestone, in which case it is called *grain-lime*, at *5d.;* and if taken at the kilns upon the Thames and Medway, at about three shillings per chaldron less.—We learn, however, from a recent account of the state of agriculture in the Vale of Forth, that lime is regularly sold at Alloa, Stirling, and other places where there are quarries, at *2s. 6d.* per computed boll, peas measure. From 30 to 36 bolls, or 120 to 140 bushels, being generally laid on a fallow; or, if dunged, from 15 to 20 tons per acre.—Prize Essays and Transactions of the Highl. Soc. of Scotland, vol. iv. p. 17.

‡ In Scotland it appears that 192 bushels of lime-shells per Scotch acre (equal to 153 per imperial acre) have been applied with succcess on light soft land.—From 240 to 360 are however generally esteemed proper for different degrees of clay. From that quantity up to 600 bushels have been laid with good effect on strong land, both arable and under good grass; but it seems generally agreed, that from 300 to 480 bushels are quite sufficient for the greater part of the most fertile districts in that country; and light soils, which requires less in the first instance, are said to have been greatly benefited by a frequent repetition.—General Report, vol. ii. p. 533.

§ Arthur Young's Essay on Manures, in the Papers of the Bath Agricultural Society, vol. x. p. 122; and Tour in Ireland, 8vo, 2d edit., vol. i. pp 6, 121, 363: Tyrone Survey, p. 111; Derby Report, vol. ii. p. 437.

|| Essay on Agriculture, 4th edit., vol. i. p. 521.

¶ Wright's Scottish Husbandry, vol. ii. p. 154.

* On some estates in the Weald of Kent, the tenants are bound to lay 100 bushels of lime per acre, on every recurrence of a fallow for wheat, which generally occurs every five years. Kent Rep. 2d edit. p. 98

information, state that from 80 to 180 bushels have been laid upon light soils with very palpable benefit, and that from 240 to 320 and even 400 bushels have been successfully applied to clays and strong grass land. It has indeed been found, that in maiden soils its use is so essential, on its first application, as to impart a permanent degree of fertility which could not be obtained by any other species of manure. In some parts of Scotland, which have been only of late years brought under an improved course of culture, and to which lime had not been previously applied, it was observed that the richest animal dung had but a weak effect upon the crops of grain. Peas, barley, and wheat, at first assumed the most promising appearance, but when the peas were in bloom, and the corn putting forth the ear, it was found that they dwindled away in nearly fruitless abortion—which, indeed, so far as the peas are concerned, ought not to excite surprise, for it is well known that they will not thrive in any soil which is not calcareous; yet the same ground, after getting a slight dressing of lime brought any kind of crop, that was adapted to the land and properly tilled, to full maturity.* Experience, indeed, proves that a certain portion of lime is necessary to bring all soils into a due state of fertility; bnt when they are once saturated with lime, or have got a sufficient quantity, whatever more is added only occasions useless expense.†—Many farmers have also learned, to their cost, that land which has received a complete liming should be either rested from severe cropping, or, after some short time, laid down to pasture. This, however, being not always convenient, the alternate system of husbandry should be adopted, even with the addition of a second year under clover, if the land be poor, and the green crops expended on the ground; and in no case should the soil be deprived of the usual dressings of dung.‡

In whatever quantity it may be employed, it is indispensable that every particle of lime be intimately blended with the soil; for if that condition be not complied with, its power upon the land will be so far lost as that operation may have been ineffectually performed. Although specifically lighter than any soil, it is, however, very commonly left in small lumps, which then fall into the bottom of the open furrow when the land is ploughed, and there remaining below the staple of the land, it naturally becomes useless for the purposes of the farmer; the operation therefore demands the most minute attention. When the lime, which may have been spread upon the ground, has been either already ploughed under, or only harrowed in, or both, it should be again harrowed and afterwards ploughed in. This must, however, be done as superficially as possible, in order to avoid burying the lime; and perhaps the best implement for that purpose is a scarifier, or one of the many scufflers now in use, as they mix the lime with the soil more effectually than can be done by the plough. The land must then be again harrowed and ploughed; but still not to a great depth; and in this manner it should get at least three ploughings and harrowings, if the soil be light, and four, or even five, according to the condition of the land, if it should be heavy: but, we repeat, that in no case should the lime be suffered to sink deep into the ground. We have indeed, on this, the evidence of Mr. Dawson, of Frogden, which, after the experience of upwards of half a century, is too well known and too highly appreciated to admit of doubt, that in every instance, upon his own land, in which lime was only harrowed in, when laid up for pasture, the ground not only continued, for upwards of thirty years, to produce the fine grasses, but, when ploughed down, those parts of the soil which were not sufficiently mixed with lime, though sown with clover, became gradually covered with bent; and he also adds his testimony, that, when properly mixed with lime, the effects of dung are not only greater, but much more permanent, whether under the tillage or pasture*. It should, however, be observed, that the depth of the ploughing may also be made to depend, in a great degree, upon the quantity of lime that is used, as well as upon the state of the soil; for not only is a less portion of calcareous manure requisite upon sands than upon clays, but as it sooner sinks into the former than into the latter, and the object is to keep a sufficient quantity mixed with the surface, it cannot, in that case, be ploughed with too shallow a furrow.

This renders a clear and well-wrought fallow absolutely necessary; but in this manner; if the lime be laid in the full quantity upon the proper soil, and if the future cultivation and manuring with putrescent matter be in all respects carefully conducted, it will produce the expected effect upon the land, the amelioration of which will last for a series of years. This mode of application is approved by the most enlightened farmers; yet there are many who affirm that grass-land forms the best bed for the reception of lime. When grass-land is broken up, it is however very generally full of weeds, which nothing but a complete summer fallow can thoroughly conquer; but if the land be clean, and the lime can be got forward in time, the application may in many cases prove successful.

Amongst numberless accounts of the effects of lime upon a variety of soils, we extract the following minute details of a series of experiments carried on during a period of twenty years upon a large farm in the north by a most intelligent man, the accuracy of whose statement appears to be entitled to the most entire confidence, and from which, if attentively considered, some useful information may be gleaned. The several fields thus operated upon were—

No. 1.—Soil composed chiefly of thin clay, some of it mixed with peat, and the whole incumbent upon a subsoil retentive of moisture: it had been in grass for several years, but yielded very poor returns.

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* It has been stated, in the General Report of Scotland, that soils of tolerable quality, in Lammermuir, only produce middling crops of oats and rye, and that the richest dung does not enable them to bring any other grain to maturity; yet the same soils, after being limed well, under proper culture, ripen every species of corn.—Vol. ii. p. 535. The same effect is stated to have occurred on the Mendip hills, in Somersetshire, in Hereford, and Derbyshire, and various other counties. See the Reports of Somerset, p. 512; Hereford, p. 57; and Derby, vol. ii. pp. 38, 401.

† Bailey's Survey of Durham, p. 209.

‡ General Report of Scotland, vol. ii. pp. 505 and 534.

* Letter from Mr. Dawson to the Editor of the Farmer's Magazine, vol. xii. p. 69.

The mode of cultivation pursued was this. The land was fallowed without taking any corn crop, and the lime was applied in a perfectly effete state during the following spring, at the rate of 220 bushels per imperial acre. The crop was oats: but little benefit was discovered from the lime until the following year, when the soil began to ferment, which showed that the lime was then in action. It was then sown with flax, the crop of which, both in flax and seed, was excellent. This was followed by peas, which returned a great bulk of haulm, but not much grain: the clay part of the land was now, however, quite loose and free, while the peat seemed more compact and firm. The field was then sown with red wheat, which turned out a very fine crop; and although it was not dunged until the ninth year, when it was thoroughly summer fallowed, the other crops continued good until it was laid down at the end of twelve years to pasture. Since that time, it has been a few years under corn; and though the produce of these crops cannot by any exertion be made to equal those preceding, yet the soil has been evidently much improved in every respect, when compared with its original state previous to the lime being applied.

No. 2.—This field, of nearly the same thin clay as the former, had been ill-treated by the preceding tenant, and was in a very exhausted state, though it is not stated that it had been previously limed. After being summer fallowed, it was laid down to pasture during several years; after which lime was applied to the sward during the winter months, and in the February following it was sown with oats. The crop was only middling, and in the six subsequent years it did not appear that much benefit was gained by the application. In the eighth year, however, the lime acted vigorously; a small part of the field, which had been left unlimed, being at least 50 per cent. inferior in crop, though the management was in every respect similar. It may, perhaps, be difficult to account for this cessation of action in the lime during this long period, though instances of a like nature are not unfrequent upon inferior soils; but it appears, from the statement of the cultivation, that a deeper ploughing had been given in the preceding season, by which no doubt, the lime was brought to the surface; and having, besides, been assisted by a copious application of dung, there can be little question that the difference between the crops was occasioned by the stimulus which was thus applied to the manure.

No. 3.—A real moorish soil, incumbent upon a close bottom which had been over-cropped, after lime, by a former tenant. This field was summer-fallowed, and limed with effete lime at the rate of 160 bushels per imperial acre. Oats were then sown; but the crop was poor, and after-attempts were not more successful. The stalk of the plant generally *singed* and decayed, after the strength of the seed-pickle was gone.

No. 4.—Of a similar soil, but rather superior in quality to the former—was fallowed out of grass, and the lime was applied hot from the kiln; but the effects were the same as those mentioned in the preceding instance. The oat-crop looked brisk at first, but decayed daily; and though dung was tried with a second fallow, and appeared to operate in a light degree, it yet did not repay the cost incurred. These two trials, which appear to have been very fairly made, clearly prove that land which is either poor in itself, or which has been worn out by the previous use of lime, will not pay the expense of a further application.

No. 5.—The soil of this field was a soft loam upon a wet bottom, which, though it did not appear to have been limed, yet was in a very exhausted state. It was, therefore, summer-fallowed after a crop of wheat, and quick-lime was laid upon it at the rate of nearly 200 bushels per imperial acre. This operated immediately; and at the expiration of sixteen years, during which time the land has been only three years in grass, its effects had not then ceased.

No. 6.—Was a strong loam, incumbent on clay which had consecutively carried five crops of grain after being ploughed from old grass. This field was dunged, as well as summer-fallowed; quick-lime was also laid on at the same rate as on the preceding, in the month of August, after which six ploughings were given. This, in less than a month, occasioned a fermentation of the soil, 'something similar to what is produced by yest upon unbaked bread.' In one respeet, the improvement made upon this field by the lime was conspicuous: barley could with difficulty be raised upon it previous to its application, but afterwards fine crops of that grain were produced, and the ground was tilled with much greater facility than formerly, which is itself a sure token of amelioration in the soil.

No. 7.—Consisted of a heavy deep loam; some of it a strong, tenacious, red clay, but almost wholly incumbent upon a close bottom. It was ploughed from old grass, and sown with oats; was summer-fallowed in the ensuing yoar, and dressed with lime, which was mostly applied hot from the kiln, being drawn from the cart in regular-sized heaps of 5 pecks each, or thereabouts, and spread the moment it was slaked by rain or atmospherical moisture. About two-thirds of the field received 240 bushels per imperial acre, the remainder from about 280 to 340 bushels per acre. The whole answered well, and the entire operation appeared to be in direct proportion to the quantity applied; nor was there any distinction discernible in the effect of that which was laid on hot, though, as the season was remarkably wet, some of it was nearly in the state of mortar, and that there appeared an evident inferiority on some ridges on which quicklime had been spread in a windy day, which probably occasioned some of it to be carried off.

No. 8.—Was also chiefly loam, though of different qualities, and mostly incumbent upon a close bottom. This field, which consisted of 50 acres, had been cropped from time immemorial, and was so tired of carrying wheat, that it seemed scarcely worth ploughing. It was therefore laid down to grass by the in-coming tenant, and remained in that state during five years, when it was again broken up. Only 30 acres were limed, and this was laid upon the sward at the rate of nearly 160 bushels per imperial acre: but some of it was laid on three years before ploughing, some two years, and the remainder only a few days before the plough entered—part of it hot, and the remainder effete. No experiment could therefore have been better calculated to ascertain the different effects of lime upon the soil; yet throughout the whole field, even in the first year, they were nearly the same; the crop was equally abundant wherever the lime had been applied, but strikingly inferior upon the 20 acres on which it had been omitted.

This would show that the application of lime to grass-land one or two years before it is broken up, as inculcated by several writers upon husbandry, is neither necessary to the soil, nor reconcilable with economy; as, in case of any declivity in the ground, much of the lime is washed off the surface by the rains, and lost before the land can be ploughed. It also proves that, in the trials just recorded, as well as in others upon the same farm, though not here mentioned, there was no visible difference between the application of quick-lime and that which was effete: added to which, there is this remarkable fact—"that much difference of opinion having prevailed relative to the quality of the limestone-quarries in the neighborhood, a trial was made of the lime from each of them upon six adjoining ridges of one of the fields—numbered 7. Though a difference to the eye was visible in almost every one of those samples, yet the effect upon the ground was in all of them precisely similar, nor could the most accurate judge say which was best. The quantity applied was in each case the same; and the operations of laying on the lime, spreading it, and ploughing the ground, were all carried on in a uniform manner."*

On the best consideration which we can apply to this important subject, we should say—Let the farmer, as a primary ground for determination, well weigh the nature and the condition of his land, as well as the amount of the cost, previous to the application of a dressing of lime. If it is to be broken up from grass which has lain long in pasture, and without having been previously limed, and that he can afford the expense, let him lay on a round quantity at once; for if it be intended as a permanent alterative—a corrective and amendment of the properties of the soil—it should get a full dose, and anything short of that will be found little better than money thrown away. But if it is to be applied to ground that has been under tillage, and upon which lime has been previously laid, it can then only be used with advantage after a series of years have elapsed, and in small quantities; upon land also which has been kept under a proper rotation of husbandry, and has been regularly manured with stable-dung, bones, rape-dust, or other nutritious substances, upon which it may exert itself, as it will merely give increased effect to the riches which may have been thus added to the soil by superior management. In such cases, however, it may be usefully employed after every second or third dunging; for whether it be owing to an imperfect fermentation, or to whatever cause, it is certain that a portion of all the dung which is laid upon ground remains nearly in a dormant state until forced into activity by the application of some alkaline or calcareous matter.

On all land it decomposes nutritive matter, which may be supposed to lie otherwise in an inert or apparently insoluble state: it is advantageous on sands, because, so long as it remains well mixed with the soil, it attracts moisture from the air, which prevents them from burning; and if applied to clays, or other deep soils on which no calcareous manure has been previously laid, it renders them less cohesive, and more easily penetrable by vegetable fibres.* On calcareous soils it necessarily has but little effect, because it here already forms a part of the matter of which they are composed; but when laid on grass-land as a top dressing, it has greatly improved every species of soil, and has promoted the growth of the finer grasses; thus adding to the luxuriance of the herbage, and augmenting the productive powers of the soil when afterwards ploughed for grain.† As lime however—notwithstanding the fact which has been just recorded regarding the similarity of its effects—whether mild or quick—yet differs materially in its strength, inquiry should always be made on that point previous to its application. The following general rules may be taken as a summary of what has been already stated.

1st. Before the application of lime, the land should be thoroughly drained and laid dry.

2ndly. It may be carried on whenever the teams are the most at leisure; but summer is the best season, and it never should be laid upon the land unless in dry weather.

3rdly. It should be laid on while in a powdery state—the drier the better—and kept as near the surface as possible, as then best adapted to mix intimately with the soil.

4thly. It may be applied either quick or effete; but if in the former state, it will have more effect in the cleansing of the land, and a less quantity will serve the immediate purpose. It should, however, be carted upon the land as soon as possible, and spread directly before the plough, letting that follow so quickly, as that the body of the lime shall be slaked in the soil; and it must be cautiously applied to light soils.

5thly. As it has a tendency to sink into the ground, and it is important to preserve it near the surface, it should be ploughed with a shallow furrow.

6thly. When found, after a few years, in lumps, and much below the surface of the land, it should be ploughed up and repeatedly harrowed, so as to ensure its intermixture.

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* Those who may wish for further details regarding these experiments are referred to the third volume of the Farmers' Magazine, pp. 77, 325. The numbers in this account are not however placed in the same order as that statement, but are classed according to the particular nature of the soils.

* Thus, among numberless instances of its effects upon land of the latter description, one is mentioned, in an account lately published of a farm in Ross-shire, which, under former management, produced such scanty crops of oats, that they scarcely paid the expense of cutting; yet in the following year, the same ground—having had 200 bushels of lime applied for the first time, together with 12 tons of farm-yard manure—yielded at the rate of 40 bushels of wheat per acre. This might, indeed, have been ascribed to the dung, as well as to improved culture; but another field, of the same kind of land, produced 36 bushels, solely with the application of lime, without any dung.—Library of Useful Knowledge, Farmer's Series, No. 18, p. 91.

† Calcareous soils have also been found to possess the advantage of guarding the sheep which graze upon them from the rot; and there can be no doubt that the application of lime, if accompanied by proper drainage, will materially assist in producing properties of corresponding efficacy. It is likewise known to be a great preventive, when lain upon pasture-land, of that destructive disease the foot-rot.

7thly. Clays and strong loams require a full dose; but for sands and other light soils, chalk, or a much less quantity of lime, will serve—each in proportion to the strength of the lime and of the land.

8thly. If the land be not supplied with the same quantity of putrescent manure that is usually laid upon other soils, the crops will suffer; and if it be not then laid down to grass for a long series of years, it will be worn out and exhausted.

[To be continued.]

DESCRIPTION, AND STATEMENT OF THE INGREDIENTS, OF THE EARTH IMPROPERLY CALLED "MARL" IN NEW JERSEY.

Extract from *Medical and Physical Researches*, by Dr. RICHARD HARLAN.

[It is feared that many of our readers think that we have been disposed to supply them, in unnecessary profusion, with information on *Marl*, and its use as manure. Yet, however copious may have been the supplies of information furnished directly from our own observations, or gathered from those of others—and however successful may have been, in some respects, these efforts to instruct, there are still other branches of this extensive subject, on which almost nothing is yet perfectly understood—and in regard to which most of the many publications that have been made, have served to increase, rather than to dispel the obscurity which envelopes the subject. We allude to the earth improperly called "*Marl*" in New Jersey—called "green sand" by geologists, and to which (long before we had ever heard of the latter term,) we affixed the (equally improper) name of "gypseous earth," in 1817, when we discovered its existence in great quantity in the banks of James River, Virginia, and contended for its identity with the earth called "marl" in New Jersey.[*] It was not until the appearance of the first communication on green sand in Virginia, from Professor W. B. Rogers, (p. 129, of vol. II. Far. Reg.) that any share of public attention was attracted to this subject, south of New Jersey. Since then, much interest has been felt and expressed, in Virginia and Maryland, and much informatiom, scientific and practical, has been furnished by Professor Rogers and others: but still we repeat that almost nothing is yet known as to the cause of the mysterious operation of this substance—and that much misunderstanding and delusion have been caused by improperly comprehending (in common parlance) this and other very different substances, under the one general name of "*marl.*" In the *Essay on Calcareous Manures*, much was said upon the then existing and very great confusion and obscurity caused by this term being applied to manures of different chemical composition, and of different modes of operation. But since that work was published, the confusion of ideas, and of substances of different kinds, has been made still worse, by the "green sand" or Jersey earth," becoming known, as existing extensively on Virginia and Maryland, and by its being also called *marl*, whether destitute of carbonate of lime, or mixed with shells or calcareous matter. The *Essay on Calcareous Manures* treats of that "marl" of which the sole, or at least the principal ingredient, acting as manure, is *calcareous earth*, or *carbonate of lime*. It mentions other ingredients, and among them "green sand" as sometimes found in marl, and adding to their value—but considers these as accidental exceptions to the general rule—and professes neither to explain nor to discuss the mode of operation of these accidental ingredients.[*] Still we frequently find that our correspondents, and other readers of the Essay, confound the marl there treated of, with the "green sand," even when the latter contains not a particle of carbonate of lime—and more often, they draw no distinction between the former in a pure state, and the calcareous marl having a large admixture of the green sand," and thereby greatly improved in its value, and altered in its action as manure—though, as we think, the cause of that action has not yet been accounted for. Professor Rogers, in his several interesting communications to the Farmers' Register, on this subject, seems to attribute the wonderful effect of this manure principally, if not entirely, to the potash which it contains. This inference (from the analysis there stated) is plausible, (as there is no other *known* fertilizing ingredient,) and would be conclusive, if potash was always present, and in sufficient quantity. But we more than distrust this explanation—because, according to our personal experience, the green sand, though sometimes producing wonderful effects, has generally been but of transient and light value—and never worth using, *except on soils made calcareous* at the same time, or previously. Our distrust is strengthened by the following extracts from the lately published work of Dr. Harlan. By the analyses here stated, neither of the specimens of the two great classes of the "Jersey Marl" contain any proportion of potash. They also furnish new evidences (in addition to the many exhibited before in this journal) that the value, as manure, is not attributable, in any degree, to *lime*—for there is but little more than 1 per cent. of lime in the specimen of what is called "fertilizing marl," and not a trace of it in the "non-fertilizing."

We are very far from meaning to speak slightingly of the "green sand marl" as manure. Its effects in numerous particular cases (though far from universally,) have certainly been not only highly valuable, but wonderful—and the investigation of the mysterious action of this manure strongly invites the continued researches of scientific men—and from the result of such researches, we may hope for most valuable instruction to farmers, and much improvement and profit to agriculture. But we maintain, that no satisfactory explanation of these effects has yet been given—and we warn our readers against confounding the effects and mode of operation of *calcareous marl*, as manure, with those of the *green sand*, whether alone, or combined by nature, or by art, with calcareous manures.

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[*] See article on the Gypseous Earth of James River, No. 4. Vol I, Far. Reg. and p. 105 of Essay on Cal. Manures, 2d. Ed.

[*] Essay on C.' Manures, 2d. Ed. pp. 48, 49, 68 and 92.

The following extracts form a part only of a longer communication to the Academy of Natural Sciences by Dr. Harlan, on the Fossil Remains, and Geology of New Jersey, and which we have first seen published in his late and splendid work.]

At various times there have been presented to the Academy specimens of fossil bones, principally from the state of New Jersey; which have not been hitherto described or noticed. I have undertaken to describe such as are most rare and interesting, and whose characters remain, in some degree, undefaced.

It will be necessary, in the first place, to offer a few remarks concerning the formation in which these fossils occur; in doing which, I shall content myself with the bare mention of the fossil *testaceæ*, some of which occur in immense numbers. For a knowledge of these, I am indebted to a gentleman eminently qualified to do the subject entire justice, and from whom we may anticipate I hope, very shortly, a full and accurate description of these very interesting remains; it is almost unnecessary to state, the naturalist alluded to is Mr. T. Say, who, together with Mr. T. Peale and myself, have lately returned from a short excursion to the marl-pits of New Jersey.[*] We were much assisted in our investigations by Dr. Samuel L. Howell, of New Jersey, who politely offered to accompany us, and whose knowledge of the country was peculiarly serviceable.

All that part of the state, denominated West Jersey, and which is included between Trenton and the Delaware Bay, on the north and south, and between the Atlantic ocean and Delaware river, on the east and west, is of oceanic or secondary formation, interspersed with patches of tertiary. The surface is composed chiefly of sand, occasionally of gravel, and very seldom of clay; not unfrequently of all three mixed.

This circumstance, in connexion with a knowledge of the nature of the substance improperly termed *marl*, will explain the vague and contradictory opinions of the farmers, respecting the manuring qualities of this earth; some of whom informed me, they considered a load of this *marl* equal to a load of *dung*. Others thought, that al though the *marl* enriched the land, and made it more productive the first year, it subsequently produced an impoverishing effect on the soil. Others again declared, that though they had frequently made the experiment, they always found the marl absolutely injurious; and this depends, in fact, on the quality of marl used.

The fact is, that this earth possesses no more claim to the title of *marl*, than any other earth in which fossil testaceæ abound; generally speaking, it is little more than a ferruginous sand. Quantities of pyrites are also found to exist, almost universally; sometimes constituting the casts of shells, at others, filling the cavities of bones; and to the prevalence of which may be attributed the imperfect state in which the organic remains are generally discovered, and the very great rapidity with which they decay on exposure to the atmosphere, unless they are varnished, or other means are used to prevent the access of the air.

It is, further, to the prevalence of pyrites we must refer the injurious effects of the "*marl*," when spread too thick upon the soil, when, on the other hand, if mixed sparingly with new soil, it destroys or reduces to earth the fibrous matter, and thus proves highly beneficial as a manure. Should the soil be composed almost entirely of loose sand, (as it frequently is) the clay, which is a principal constituent of some of the "*marl-pits*" will give consistency to the soil, and enables the vegetables to take root; in which sense it may be said to act as a manure.

Not unfrequently whole strata or beds of this *marl* will occur without a single fossil, of a loose friable structure and moist nature, more or less granulated, and of various colors, but most commonly of a dark slate-black or greenish color; and has been by some supposed to consist chiefly of decomposed organic remains—but how erroneous is this opinion, will be clearly comprehended by the analysis of this earth, furnished some years ago, by Mr. Henry Seybert of this city. (Vid. Cleaveland's Min. and Geol. 2d ed.)

Silex,	49.83
Alumine	6.00
Magnesia	1.83
Potash	10.12
Water	9.80
Protoxide of Iron	21.53
Loss	69
	100.00

This specimen of "*green earth*" or the supposed Marl, was from Rancocus creek; the quantities of its constituent parts, no doubt, vary with the locality. It constitutes, in almost every instance, the matrix of the fossil reliquiæ, of which the Terebratula and Ostrea occur in the greatest profusion, sometimes commingled, at others in nearly distinct beds, as at Mullica hills and Blackwood town mills. At the county poor-house we examined a creek, at the bottom of which were beds of fossil Ostreæ, and a few *rolled* specimens of Favosite and Fistularia, together with broken Belemnities; occasionally we observed some of the beds composed of Ostreæ, Belemnities, Terebratula, &c. heaped together in every direction and position, conglomerated together by the green sand, and quartz pebbles, scarcely any of the remains preserved entire.[*]

I have been indebted to Mr. A. Seidler, an experienced operative chemist, for an accurate analysis of the fertilizing and non-fertilizing varieties of "marl," the former of which is now extensively used in New Jersey as a manure.

Chemical Analysis of the green fertilizing marl from New Jersey, dug from Lewellyn's Pit. By A. Seidler. November, 1835.

This mineral appears as a greyish-green granular mass, in which, by aid of the lens, small particles of a shining lustre are discernible. By exposure to a moderate red heat, it loses its greenish colour, together with a part of its weight, and the former is changed into a light brown, intermixed with grey. With borax, before the blow-pipe, it melts into a blackish slaggy globule of considerable hardness. It does not effervesce with acids; its specific gravity is 1.485.

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[*] Since Mr. Say first commenced the description of the New Jersey fossils, numerous investigators have entered this field of science. The communications of Messrs. Vanuxem, Conrad, Lea, Morton, Van Renselaer, Dekay, &c., in the Journal of the Acad. Nat. Sc. and N. York Lyc. of Nat. Hist. will be consulted with interest. The present essay was originally communicated to the Acad. Nat. Sc. Philad. in May, 1824.

[*] The "marl" from Rancocus creek has been ascertained to be of the non-fertilizing species; the fertilizing variety, or shell marl, does not occur at that locality.

Experiment, No. 1.

Five hundred grains of this mineral were carefully heated in a small glass retort until red hot; its colour changed as above stated, and after having cooled, its weight amounted to four hundred and eighty grains. During this process no gas (carbonic acid) was disengaged, but in the tube of the retort and the adopter a quantity of water was condensed, whose weight nearly corresponded to the above loss. We may, therefore, consider this mineral as a hydrate, or a compound of hydrates.

Experiment, No. 2.

The above four hundred and eighty grains, finely pulverized, were boiled in a matrass with a long neck, for several hours, with nitro-muriatic acid, consisting of five parts muriatic acid of fifteen degrees Baumé, and one of nitric acid of thirty-five degrees.*

Again.—A considerable part of the mineral was dissolved, but the brown colour had not disappeared; the solution was set aside for twenty-four hours, and the yellowish solution decanted from the sediment and again treated for several hours with a new addition of nitro-muriatic acid. The color of the mineral had disappeared considerably more, but was not altogether white: therefore, it was set aside again for twenty-four hours, and then decanted, a new portion of acid added, and treated again as above.

After one hour's boiling, the colour had completely changed, and appeared perfectly *white.* The matrass was removed from the fire, and the liquid allowed to subside; after having decanted the same, the residue was washed with distilled water until perfectly insipid; the residue, gathered on a filter and well dried, at 170 degrees, weighed 277½ *grains*, and proved to be silex.

Experiment, No. 3.

All the clear decanted solutions of experiment No. 2, which were of a yellow wine colour, were heated gently in a matrass, and then saturated with caustic ammonia: a copious and voluminous brown precipitate issued; which was brought on a filter and perfectly edulcorated with warm distilled water.

This precipitate (anticipating that it consisted of alumina and oxyd of iron) was boiled in a silver vessel with five hundred grains of potash, and afterwards gently evaporated to dryness and exposed to a moderate red heat, re-dissolved and filtered. The brown residue on the filter copiously washed with distilled water, and dried at 170 degrees of heat, weighed 134 grains, and proved to be pure oxyd of iron.

Experiment, No. 4.

The alkaline solution of the foregoing experiment was saturated minutely with muriatic acid, and a voluminous white precipitate was formed, which proved to be pure alumina; after washing it copiously and drying, it weighed 62 grains.

Experiment, No. 5.

The remaining solution precipitated with ammonia in experiment No. 3, was examined further, and by adding oxalate of ammonia, a precipitate was formed, which, after it had been well washed and dried, weighed 14 grains, and showed all the properties of *oxalate of lime*, which, after destroying the acid by exposure to heat, left 6 grains of pure lime, which corresponds exactly with the proportions of this salt given in the chemical works.

Experiment, No. 6.

As it is a known fact that magnesia forms a triple combination with muriate of ammonia, which cannot be decomposed by potash, unless the ammonia is driven out in a higher temperature, the solution from which the oxalate of lime had been obtained, was mixed with a sufficient quantity of pure potash, heated and finally evaporated to dryness. The dry mass being now deprived of all the ammonia, was re-dissolved, but no precipitate made its appearance, even after standing over night: therefore it contained no magnesia.

Conclusion.

According to the foregoing experiments, this green marl is composed of

277.50 grains of	Silex.	Experiment No.	2.
234. "	Oxyd of Iron.	"	3.
62. "	Alumina.	"	4.
6. "	Lime.	"	5.
20. "	Water.	"	1.
.50 "	Loss.		
500			

Analysis of the non-fertilizing green marl from New Jersey, by A. Seidler.

The external appearance of this mineral is of a dull olive green, granular, or rather consisting of crummy masses; which, by exposure to a slight red heat, loses its green color, and part of its weight, becoming of a blackish brown. It does not effervesce with acids: before the blow pipe it melts, with borax, into a slaggy globule. Specific gravity, 1.566.

Experiment, No. 1.

Five hundred grains of this mineral were heated in a small glass retort, long enough to change its color entirely; a quantity of water was condensed in the tube of the retort and adopter; it lost by this process thirty-one grains, the loss corresponding with the evaporation. The remaining 469 grains were boiled repeatedly in a long-neck glass matrass, with a mixture of five parts muriatic acid of 15°, and one part of nitric acid of 35°, Baumé, until its colour had entirely disappeared. The insoluble white residue, after copious washing with distilled water, and being well dried, weighed 277½ grains.

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* These acids, as well as all other re-agents employed in this analysis, were chemically pure.

Experiment No. 2.

All the acid solutions and washings obtained in the foregoing experiments, were mixed together and saturated with pure ammonia. A voluminous brown precipitate ensued, and after it had been separated by the filter and well washed, was boiled in a silver vessel with 500 grains of pure potash dissolved in a sufficient quantity of water, and afterwards evaporated to dryness, and exposed to a gentle red heat for half an hour, and then again boiled with water repeatedly in order to dissolve the alkaline mass; then filtered; the brown insoluble residue on the filter being well washed in hot water and dried, weighed 135 grains, and proved to consist solely of oxyd of iron.

Experiment No. 3.

The neutral ammoniacal solution of No. 2, which remained after having separated the precipitate, was further examined, in order to detect lime, if any existed: a sufficient quantity of oxalate of ammonia was added and strongly agitated, and exposed to heat for half an hour; no precipitate was formed, even after repeated agitation, and twelve hours repose; the same result followed after adding phosphate of ammonia: consequently, lime formed no part of the mineral.

Experiment, No. 4.

The clear alkaline solution obtained in experiment No. 2, after the separation of the oxyd of iron, was accurately neutralized by pure muriatic acid: a white gelatinous precipitate was formed, which, after separation by the filter, and being well washed and dried, weighed 52½ grains, and proved to be pure alumine.

Experiment, No. 5.

To the remaining solution of experiment No. 3, after having tested it for lime, a sufficient quantity of pure potash was added, and the whole evaporated to dryness, by which process the ammonia was completely expelled. The remaining saline mass was re-dissolved in water, and appeared perfectly transparent; no trace of an insoluble substance could be discerned, even after twelve hours repose:—it consequently contained no magnesia.

Conclusion.

These experiments exhibit the following constituent parts of this non-fertilizing marl, viz:

Experiment No. 1,	277.50	Silex
2,	135.	Oxyd of Iron.
4,	55.50	Alumine.
	31.	Water.
	499	
Loss,	1	
	500	

Besides the fossil reliquiæ above named, we may further add Ammonites, Rostellaria, Turbinolia, Arca, Pyrula, Pecten, Donax, and numerous others, together with the bones or teeth of cetacea, sharks, crocodiles, turtles, mosasaurus, &c., lignite, amber, phytolithites, roots of trees encrusted with pyrites, &c.

This very extensive formation, of which we are now treating, lines the coast for several hundreds of miles, commencing at the northern extremity of Long Island, and extending as far as the Gulf of Mexico; and borders immediately the primitive rocks on its northern and eastern limits.

DIFFERENCE OF THE GROWTH, CULTURE, AND PRODUCT OF GRAPE VINES, IN THE UNITED STATES, AND IN EUROPE. OSAGE ORANGE.

LETTER I.

To the Editor of the Farmers' Register.

Columbia, S. C., April 29th, 1836.

If you think the following is sufficiently interesting to fill a page of your excellent periodical, have the goodness to honor it by giving it room.

The comparing of the various objects of agriculture in different countries may lead to reflection and elicit improvements in the culture and mode of management. I was led to think on this subject by reading a very good book—"Journal of a recent visit to the principal vineyards of Spain and France &c., by James Busby, Esq."—This gentleman has visited those countries like a man of sense, and his observations are usually correct, as his descriptions of men and things are worthy of the utmost confidence. He has visited countries and persons which I knew well, and it gave me great pleasure to see him mention so truly, gentlemen who deserve all the praise he justly bestows on them. It also gives me great pleasure to have this opportunity to notice here in support of Mr. Busby's high character of Mr. Delisle, Professor of Botany, and Director of the *Jardin des Plantes* at Montpelier. This gentleman's urbanity and liberality to strangers are above all praise, and I have experienced both. Mr. Busby notices the very small size of the vines in Burgundy, Champagne, and elsewhere, and their being planted, frequently as near as from 15 to 20 inches apart, and even closer in some instances. This I knew perfectly well; but it nevertheless seems very strange when compared with the growth and large size of our vines in this country, even in very poor sandy soil. To show this more satisfactorily, I shall here give a rough description of the vines in my garden. My grape-vines, which I use chiefly for wine, cover one sixth part of an acre. They are 45 in number, viz. 37 of my Madeira, 6 of the Lenoir, and 2 of the Bland, all made into wine separately. They are trained so as to cover the flat top of a trellis 8 feet from the ground, and they very fully cover it, none of the foliage or fruit being allowed to grow below the top of the frame. The oldest of these vines were planted as cuttings 27 years ago, and some of them are very large. The largest of them covers almost entirely a space of 48 feet by 30 feet. Just above the ground it divides into 5 branches of the following respective dimensions in circumference: 11 inches, 8½, 8, 7½ and 7½ inches. This is of the kind known as Herbemont's Madeira, and is, most undoubtedly, an European vine. It is, by some persons in Charleston, called Burgundy grape, and is one of the principal vines cultivated in the French province of this name, as also in Champagne, &c. I think it is there called Pineau or Morillon, and is the greatest bearer I ever have seen, and its fruit is equalled by few, and surpassed by still fewer, as a delicious grape for the table as well as for wine. This, then, is one of the vines ,which, in those provinces are planted as near as 15 or 20 inches from each other! What can cause this enormous difference in the growth of the same plant? It cannot be richness of soil; for in parts of France and Spain their vineyards are highly manured, and grow in a more genial soil, being highly calcareous. My soil is very light and sandy, and although the vines alluded to, as growing in my garden, are occasionally manured, yet it is by no means very rich; and at my farm, where the vines have only been manured at the time of planting them, and the soil there is very poor and sandy, they grow nearly as large as in my garden. I have noticed strangers sometimes look at the soil and the vines alternately, in the utmost surprise, not being able to realize in their minds, such a growth on such a soil. This is most certainly very strange, and we can scarcely conceive that such must be the sole effect of climate. Can it be really the effect of climate, or is there some other cause that we have not yet found out? It could not well be attributed to the mode of culture and training; for my first efforts were to cultivate and train the vine low as is done in France, allowing them more space, however, than is done there, for I expected a larger growth on account of the climate. I soon found it impossible to keep them down, for when they were from 6 to 12 years old, they would put out shoots in one summer 20 or 30 feet long, or even more. I was, therefore, obliged gradually to adopt my present mode of training. What can be the cause or causes of this enormous difference in the growth of the same plant? It must also be noticed there are several other kinds of French vines, particularly the white grapes, that never assume this great luxuriance. I have another, which is also said to be a Burgundy grape by persons who know to a certainty of its having been imported from France. This vine was called by a French gentleman, many years since, the "giant vine," on account of the great vigor of its growth. It makes a very good red wine; but I do not cultivate it much, because it is exceedingly liable to rot, much more so than my Madeira; though both are said to do well in the low part part of this State, principally in Charleston and Beaufort. If it really be so, I am much surprised that some one does not cultivate it on a large scale for wine; for its produce would there surpass any after production in profitableness, reaching, or even exceeding, 2000 gallons of wine per acre.

Now to compare the product of our gigantic vines with the dwarfish ones of France. Their crops seldom exceed 300 or 400 gallons per acre, very rarely, though sometimes reaching, however, to 1000 gallons. My vines rot much every summer, sometimes more, sometimes less, according to the season. The last was most unfavorable, and at least two-thirds of the grapes were lost by the rot. The remaining ones grow probably the larger for it, as the latter part of the season was very favorable. Now, notwithstanding all this loss by rot, I made from that sixth part of an acre in my garden 230 gallons of wine, which multiplied by 6 gives 1380 gallons as the produce of an acre similarly situated. The culture of the vine in this country is a most interesting subject, that deserves to be followed up with zeal by wealthy public spirited gentlemen, or more properly by public aid.

I had intended, sir, to give you the dimensions of several other of my vines; but my paper is so nearly filled up, that I have only room enough left to tell you that I have tested the truth of the article in the last No. of the Farmers' Register relative to the *maclura aurantiaca* (osage orange.) Silk-worms really feed freely on its leaves, and I have grafted it on the Chinese paper mulberry, (*Brousonetia*,) and roots of the common mulberry, with apparent full success. My good friend, T. S. P. having sent me seeds of this valuable tree, I planted them, and I have at least one hundred of them coming up finely. This is also a very interesting subject, which deserves the attention of the lover of his country.

N. HERBEMONT.

LETTER II.

The subject of *provignage* requires some explanation for those persons who are not acquainted with the culture of the vine in France. *Provignage* is usually nothing more than the practice known to all gardeners of laying a branch of a plant for the purpose of making it take root, and thus multiplying the subject. This word has, however, besides this, another, though analogous meaning, among the cultivators of the vine in Europe, and principally in Burgundy and Champagne. By it is also understood the singular and strange operation of laying down in a trench, not only the whole vine, but all the vines of a vineyard, leaving only the summits out of the earth. The object of this is to renew the vines without losing time, as the vines bear a crop the same year that the operation is performed. By this operation, all the vines of a vineyard will, after a number of years, be very far from the place where they were originally planted. I called this a strange operation; for, where a plant is in a soil and climate fully suited to its perfect success, this cannot be necessary, particularly for a plant, which like the vine, will live and thrive, in favorable circumstances, for several hundred years. This *provignage*, or laying of the whole plant, has been practised time immemorial; but it was only after a considerable number of years, when the vines really needed renewal. But it is now done in some parts of Champagne, as frequently as every three years. This being a very laborious and expensive operation, the advantages of it must have been very fully ascertained. The high prices of the wines produced in that country may warrant this expense; but it certainly would not do for the great bulk of the vine countries in Europe and elsewhere. The vine being there a very diminutive plant, compared with its natural exposition in more southern countries, renders this operation practicable; but it would be impossible with us, except with very few, if any of the least vigorous growers. With us, however, it is not necessary, for I feel confident that most of my vines are capable of living and thriving for several centuries, if suffered to do so. It would be a very wrong idea, to suppose that because our vines here are very extensive and large, that they must look old and decrepid. They are not at all so. They are, on the contrary, most luxuriant and fruitful. It is also proper to observe that their size is no obstacle to their being as closely pruned as the short vines of Europe; for the pruning takes place on the growth of the preceding year; this may be cut as short as convenient or suitable. One of our large vines that covers a very great extent of ground, is, in reality, like a great number of plants of the size of the European ones, issuing from the old wood, instead of out of the ground. If the European writers on the subject are correct in supposing that old vines produce richer grapes than young ones, and that the sap becomes better elaborated by passing through the vessels of old wood, and the leaves of the young, our large vines must have a great advantage over the small ones. I have great doubt of the correctness of this principle; for they also say that the nearer the fruit is to the ground, the richer it is, and the better it ripens. This, although it appears irreconcilable with the other proposition, appears to be a well ascertained fact, that, in the colder parts of Europe, where the vine is cultivated, the grapes produced on arbors, and high-trained vines, are poorer in saccharine matter than those from the low vines of their vineyards. It is probable that the reason of this is, that, on the low vines, the heat reflected from the ground has a greater effect than on the high ones. In our climate, we have heat enough to reach to any height to which we may choose to train our vines.

The very great and praiseworthy industry and ingenuity of our European brothers, in converting a country most evidently very unfavorable for the growth of the vine, into one producing some of the highest priced wines in the word, shows that all we need, to insure success, is perseverence, and a number of experiments to ascertain, not merely the most suitable mode of cultivation, but also the most suitable kinds of vines for our purposes, as to hardiness and richness of fruit. I am now too old to make many more experiments on this most interesting subject; but others will follow who will probably be more successful. What would most undoubtedly be the very best way, would be to have those numerous experiments which require years to give the results, undertaken at the public expense. I have long labored in the vineyard unaided—but, on the contrary, discouraged by sneers, &c. But yet, if I have not had the most complete success, I have done something, and my labors will not be altogether lost. I shall persevere as long as I am able.

I continue to feed the few silk worms I have with the maclura at the same time as I give them also mulberry leaves, and I find that they feed indiscriminately on either of these plants. If there be any difference, it may be that they prefer the maclura. This subject may become very interesting, particularly if it be found that the latter plant is hardier, and resists late spring frosts better than the mulberry. N. HERBEMONT.

From Chaptal's Chemistry applied to Agriculture.

GENERAL VIEWS OF THE ATMOSPHERE, CONSIDERED IN ITS EFFECTS UPON VEGETATION.

[Continued from p. 58.]

Of the Imponderable Fluids of the Atmosphere.

Besides the ponderable substances which constitute the atmosphere, and those which are found in it accidentally, it receives some imponderable fluids, of which the effects are less known, but which appear to play an important part in the atmospheric phenomena: of this number is the electric fluid.

1. Electricity is developed by friction, and transmitted by simple contact. It is accumulated in bodies when they are insulated; and it is communicated in the same manner as heat, when bodies which are non-electric approach those which are electric.

The singular properties of electric fluid containtained in the atmosphere, and the frequent variations which it undergoes, give rise to a numerous phenomena, for which observation and experiment enable us to account. When this fluid is abundantly diffused throughout the atmosphere, it exercises a powerful influence over vegetation, excites the action of oxygen, and determines the condensation of the aqueous fluid. Davy has observed that grain germinates more quickly in water charged with positive electricity, than in that which contains the opposite principle; and that it is a well known fact, that fermentation takes place most rapidly during a thunder-storm, and that a liquid, composed of a variety of principles not very closely united, milk for instance, is decomposed, and becomes acid under a highly electric state of the air.

2. Whatever may be the opinion we may adopt, as to the nature of the principle of heat, there can be no doubt that there exists in the atmosphere, and in all terrestrial bodies, an imponderable fluid, unequally imparted to them, and which renders their state solid, liquid, or gaseous, according as the affinity, existing between their particles and the fluid of heat, is more or less strong. It is this state which we regard as the natural state of bodies.

Exposed to an equal degree of atmospheric temperature, all bodies, in their natural state, are penetrated by unequal quantities of the fluid of heat; but as the fluid is in combination with the particles of the bodies, and thus forms one of their constituent principles, it does not develope its most important property, which is that of heat; and in this state it has been agreed to call it *caloric*; and it only takes the name of *heat* when it is free, and disengaged from all combination.

Caloric, interposed between the molecules of bodies, tends to separate them from each other; and when accumulated beyond its natural quantity, the excess acts as heat; changing the form of bodies, and causing them to pass from the solid to the liquid state, or from the last to that of vapor.

Those bodies which exist naturally in a gaseous state, and which are rendered solid by being brought into combination with other substances, return to their natural state as soon as a sufficient degree of heat is applied to destroy the force of the affinity which unites them to their base. But those which are not originally gaseous in their form, under the influence of heat pass through all the degrees intermediate between their natural state and that of imperceptible vapor; and return to the concrete state, when deprived of the excess of heat which had been applied to them.

Caloric can be extracted from bodies by percussion or compression, in the same manner as water is expressed from a substance which has imbibed it. When a body is deprived of its caloric by either of these means, the molecules composing it are brought closely to each other, and its porosity, and consequently its volume, diminished. The act of striking, or rubbing hard bodies together, produces the same effect; the portion of caloric, which is in either case set free, acts as heat.

The temperature of bodies can be lowered, or elevated, by placing them in contact with other bodies more or less hot than themselves. The fluid of heat will pass from one to the other, and produce an equilibrium in their state, according to their respective capacities for caloric, which enable them to absorb unequal quantities of it.

All bodies in their natural state contain a determinate portion of caloric; but when their density undergoes a change, by the variations of temperature to which they are exposed, they lose or absorb caloric, in proportion to their contraction or dilation. The gases, which become solid by entering into combinations, the vapors which are condensed, the solids which are contracted, impart to the air a portion of their caloric, which becomes heat; whilst all these bodies, on receiving heat from the air, are dilated.

The phenomena of composition, and decomposition, which uninterruptedly renew the surface of our globe, give rise every moment to the emission or absorption of caloric. Two substances, entering into combination, form a compound which perhaps requires more or less caloric than is contained in the two component principles; and then either heat or cold is necessarily produced during the operation. Those gases, which become solid by entering into combination, part with their caloric whilst undergoing the change, and thus produce heat. In combustion, where oxygen is the principal agent, there is a constant disengagement of caloric, because that gas, in general, forms solid or liquid compounds with combustible substances; and it gives out a portion of the caloric which preserved it in its gaseous state.

These principles established, we can easily explain a part of the effects produced upon vegetation by the variations of temperature.

The changes of temperature, experienced by the atmosphere in the course of a year, are so great, as to cause some liquids to pass alternately either to the solid or aeriform state, and some solid bodies to become liquid. The natural effect of heat upon these bodies is, by dilating them, to weaken the force of cohesion which unites their molecules, and, by facilitating the action of chymical affinity, to enable them to enter into combination with foreign bodies. Thus heat renders the juices of plants more fluid, and facilitates their circulation through the cells and capillary vessels; and, by giving activity to the suckers of roots, enables them to draw from the earth the juices necessary for their nourishment.

Above a certain temperature, heat, by promoting evaporation, causes the juices of plants to become thickened and dried in their organs, and thus vegetation is arrested, and life suspended. This effect always takes place during great heats, when neither rain, dew, nor irrigation can sufficiently repair the loss occasioned by evaporation. This effect would be more frequent, if provident nature did not employ means to moderate the action of heat.

The first of these means is the transpiration of the vegetables themselves, which cannot take place without carrying off a large portion of heat, and thus preserving the transpiring body at a temperature below that of the air. The second means is found in the organization of leaves, which are the only parts of a plant where transpiration takes place. That surface of leaves which is exposed to the direct rays of the sun is covered by a thick epidermis, which resists the calorific rays. In herbaceous plants, as in the stalks of grasses, this covering is composed principally of silex. In other plants it is analogous to resin, wax, gum, or honey; whilst the epidermis, which covers the opposite sides of the leaves, is fine and transparent. It is by this, that transpiration and the absorption of nourishment from the atmosphere are carried on. If we should reverse the order of things, and present the under surface of a leaf to the rays of the sun, we should very soon see that it would make great efforts to resume its natural position.

When a plant is dead, or rather when an annual plant has fulfilled its destiny, giving assurance of its reproduction by the formation of its fruit, the action of heat and of the other chymical agents is no longer modified by any of the causes of which I have just spoken, and the plant receives their impression in an absolute and unmodified manner. When the temperature of the atmosphere sinks below a certain point, the fluids in plants become condensed, the movement of the juices is retarded, the activity of their organs languishes, and is at length suspended, until restored by the return of heat. The action of the atmosphere upon plants, when deprived of its due proportion of heat, is however modified by the emission or disengagement of caloric, which is always given out when liquids are condensed, or solids contracted; and this occasions the temperature of plants, during the winter, to be always a little higher than that of the atmosphere.

It sometimes happens that the temperature of the atmosphere sinks so low, as to produce fatal effects upon plants, by freezing their sap, and thus occasioning their death. This effect does not always depend upon the intensity or degree of cold to which they are exposed, but upon particular circumstances. I have seen olive trees resist a temperature of 22°.2 Fahrenheit, and perish from that of 28°.6; because in the last case the snow, which had collected upon the branches of the trees during a night, was dissolved the following day by the heat of sun, and the wet tree was exposed during the succeeding night to the action of 28°.6. There is nothing more dangerous for corn and grasses, than those frosts which follow immediately after a thaw, because the still wet plants, not being deeply rooted in the ground pulverized by the frost, have no means of defending themselves from the effects of the cold.

3. Sennebier was the first to admit that the influence of light was hurtful to the germination of seeds. Ingenhouz confirmed this opinion by actual experiment; but M. de Saussure, who caused grains to germinate under two receivers, the one opaque, and the other transparent, is convinced that germination took place in both cases at the same time; but that the subsequent vegetation was more rapid and vigorous under the transparent, than under the opaque receiver. It is easy to reconcile these opinions and results, though apparently so contradictory, by separating the action of heat from that of light. As plants transpire very little during their first stage of germina-

tion, if they are exposed to the united influence of the two fluids, that of heat will exercise upon them its full force, because there is no evaporation from them to temper its effects, and their delicate organs will be withered and dried up. It is for this reason that gardeners are so careful to shelter their nurseries from the rays of the sun, and not to expose their plants, till by the developement of their leaves they are able to moderate the effects of heat by transpiration.

Though the action of light upon vegetation does not appear to be so important as that of the other fluids of which I have spoken, it is not in reality less so. Plants, which are raised in the shade or in the darkness, are nearly or quite without color, perfume, taste, or the firmness of texture of those that are exposed to the direct rays of the sun; and if the luminous fluid does not combine with the organs of plants, we cannot deny that it is a powerful auxiliary in their combinations.

It is generally acknowledged that plants do not emit oxygen gas, excepting when exposed to the direct rays of the sun; and it is known also that flowers rarely produce fruit, if raised entirely in the shade. According to the observations of M. Decandolle, the sensitive plant, if carried into the shade, closes its leaves as during the night, and re-opens them immediately upon being again exposed to the rays of the sun, or of a lamp.

The grand discoveries of Herschell have thrown great light upon these delicate questions. That learned philosopher has proved, that amongst the various rays constituting a pencil of light, there are some that possess nearly exclusively the property of being luminous, others, that of affording heat. Wollaston and Ritter have added to these important facts, that there exists a third species of rays, which appear to act upon bodies as powerful chemical agents.

When we reflect upon the influence which the atmosphere exercises over vegetation and over the principal operations which are carried on in rural establishments, such as fermentations, the preparation of various productions, and the decomposition of some substances, in order to apply them to particular purposes—we are astonished at finding nowhere any of the simple and unexpensive instruments which announce its changes every moment.

I do not propose that delicate or complicated instruments should be provided; but I wish to find on every farm an hygrometer, to ascertain the humidity of the atmosphere, a thermometer to indicate the changes of temperature, and a barometer to determine the weight of the atmosphere. This last instrument would be particularly valuable, as predicting the changes of the weather; the rising of the mercury announces the return of dry weather, and its sinking warns us of rain and storms. We can regard these variations but as signs; but they are signs much more certain than those which country people derive from the changes of the moon.

From the Hudson Republican.

A PRODUCTIVE FARM.

TO THE EDITOR:—Wilt thou oblige the Agricultural Society of this county, by publishing the annexed extract from a letter addressed to Dr. J.P. Beekman, by Samuel T. Vary, of Kinderhook, giving a statement of the products of his farm.

It will be understood that the account is for sales actually made, and that he has retained sufficient grain and provisions for the winter's use; and has besides drawn his living from the farm during the year. The farm has 145 acres of land under cultivation. The soil is sand and fine gravel, sand and loam, and sand and clay.

Sales and products of the farm for 1835.

12 calves,	$37 89
196 lbs. butter, at 20 cts.	39 20
1442 do. cheese, at 8 cts.	123 37
30 lambs, at $1 87½ cts.	56 25
850 bush. oats, at 52 cts.	442 00
375 do. potatoes, at 25 cts	93 75
20 tons of hay, at $15,	300 00
72 bush. onions, at 50 cts.	36 00
500 do. corn, at 82 cts.	421 88
220 do. wheat, at $1 50,	330 00
4 cows, beef	69 00
2 oxen and 2 steers,	130 00
7 shoats,	17 00
1440 lbs. pork, at 7 cts.	100 80
22 wethers, at $4	88 00
	$2,285 13
Deduct money paid out,	383 75
Net profit,	$1,901 38

If some of our active farmers would keep a similar account during the year, and also a written account of their agricultural experiments, and present them to be read at the winter meeting of the Agricultural Society, it would add much to the interest of those meetings, and very much extend the sphere of the society's usefulness. Such communications may be addressed to any officer of the society, or to

JOHN STANTON GOULD,
Corresponding Secretary, Stockport.
2d month, (Feb.)

From the Journal of Commerce.

IMPORTATION OF AFRICAN ASSES.

Five large African male asses, of a nearly milk white color, were on Saturday landed from the brig Commaquid, which arrived here on Friday from Gibraltar. These animals are altogether unlike in appearance to the English ass or donkey, one of which may be occasionly seen here, and which is a diminutive little animal, and of very little use as a beast of burthen.. The African ass is, on the contrary, as large as a middle sized horse, and has been, as far back as the days of scripture, an animal much prized for its useful qualities in Asia and Africa. The present importation—although there are probably asses enough already in the country—is likely to prove a valuable acquisition.

From the Tennessee Farmer.

GROSS MISCONCEPTIONS AS TO THE NATURE AND VALUE OF AGRICULTURAL PAPERS.

Among a large portion of those who are engaged in agriculture, an idea prevails, that agricultural papers are only valuable as the means of conveying to the public that agricultural knowlege acquired by their conductors, of which the rest of mankind are ignorant—Nothing can be more fallacious than such a notion, and it is one of a most pernicious tendency to the great cause of agricultural improvement, and, consequently, to the best interests of the country. True, the conductor of an agricultural paper, if a practical farmer, should, and if well qualified for his task, he will, feel that solicitude for the improvement of his occupation which will induce him, not only to reason and to reflect on the subject, but often to reduce to the infallible test of actual experiment, the suggestions of his own mind, as well as those which may be made by others. But were the promulgation of the knowledge thus acquired by a single individual, no matter how accomplished a farmer he might be, the only benefit to be derived from the persual of his paper, its beneficial influence would necessarily be confined within comparatively very narrow limits indeed. It must be reccollected that there are thousands in every civilized country on the globe, who are constantly engaged in efforts, by the same means, to acquire a more perfect knowledge of their profession, and who are every year contributing largely to the existing stock of agricultural knowledge. To disseminate as widely as possible, not only the new discoveries thus made by this vast number, both of scientific and practical farmers, and, what is perhaps of even still greater importance, to diffuse throughout the great mass of farmers the existing knowledge, now confined to a few, to illustrate the benefits, both public and private, which must result from reducing it generally to practice, and to urge on all engaged in agriculture the adoption of such a course, by appeals, not only to their patriotism, to their ambition for distinction in their profession, but to the still more powerful motive of self interest in most men. These are the great objects aimed at by agricultural papers—objects, to the attainment of which they are admirably adapted, and objects which they have actually accomplished to an immense extent in every country in which they have received an extent of patronage in any degree proportioned to their intrinsic value and high importance. Were this notoriously correct view of the subject generally entertained, self interest alone would effectually secure to agricultural publications, at least among farmers and planters, a far more general and extensive patronage than they have ever yet received, for it may be safely asserted, that while they are among the cheapest periodicals of the day, no farmer of common intelligence can regularly peruse an agricultural paper, conducted with ordinary ability, without being actually benefited, even in a pecuniary point of view, to an amount at least tenfold greater than the price of his subscription—besides the salutary and the almost incalculable benefit which the farmer's children cannot fail to derive from the intellectual and moral improvement produced by the reading of such a paper. The general circulation of such works should, therefore, be zealously promoted and encouraged, not only by the agricultural community, but by all who feel any interest in the welfare and prosperity of their country.

REMEDY FOR THE "MURRAIN" OR "CAROLINA DISTEMPER" IN CATTLE.

Amelia, April 15th 1836.

Take the boughs or twigs of common cedar, (those boughs having the most berries are to be preferred,) pack them in an iron pot or boiler as closely as you can—fill the vessel with water and boil it moderately until about half the quantity of water is boiled away—then let it stand one hour to cool. Give one quart of the tea by drenching the sick animal as we do a sick horse—repeat the dose every half hour until it operates. I have tried this remedy for the above disease, and with confidence recommend it to the citizens of Virginia where the cattle are subject to it. It operates as a very powerful diuretic as well as cathartic. I have relieved horses of violent attacks of stranguary by this cedar tea, when every other remedy had failed.

R. B.

PROMPT SUBSCRIPTION TO THE EASTERN SHORE RAILROAD.

"We learn (says the Richmond Compiler) that all the stock for the Eastern Shore Rail Road, has been taken in Philadelphia. This scheme proposes a connexion of Philadelphia, by means of a railway through Delaware, Maryland, and the Eastern Shore counties of Virginia, with the Portsmouth and Roanoke Rail Road. The completion of this magnificent work will add greatly to the trade and travel of the latter road, and will divert much of it from Baltimore."

This route is, for much of its length, on a ridge, and is one of many such lines presented in the tide water region of the Southern States, where nature has executed the grading, and better than art could possibly have effected it in any route across the course of streams. When the immense superior facilities of these level ridge-routes, are known and properly appreciated, there will be constructed on them numerous branch rail roads, any of which, if named *now*, would draw ridicule upon the proposer. Every ridge between adjacent streams in lower Virginia and North Carolina, is almost a perfect level: and for many miles on such ridges, the wooden railroads, for ordinary wheel carriages on Williams' plan, (described in Vol. I. Far. Reg.) might be constructed with pine timber cut down along the track, and which would serve to create means for cheap transportation, where none, or only the most laborious and costly, now exists, and thereby would give a new value to timber and all other heavy commodities, to the lands producing them, and to the business of the railroads, and to the market towns, to which there new products would be brought for transportation and for sale. Many tributary branches to both the Portsmouth and Petersburg railroads will yet be opened, which have not been proposed, and scarcely thought about.

FOWL LICE.

When confined, or when simply roosting, in an enclosed house, hens are apt to become infested with lice, in the warmer months. Dry wood ashes, put on the ground where they dust themselves, will very soon free them.

REVIEWS OF NEW WORKS ON CALCAREOUS MANURES.

From Silliman's Journal of Science.

Essay on Calcareous Manures, by **Edmund Ruffin.** Second Edition. Shellbanks, Va., 1835. 8vo. pp. 116.

On the use of Lime as a Manure, by **M. Puvis,** translated for the Farmers' Register. Shellbanks, Va., 1835.

There is no one of the useful arts to which the application of chemical science may be made of as much importance as to agriculture. We cannot indeed inquire in the minute and delicate processes by which nature elaborates the inert matters of the soil, and converts them into the living plant; but we can examine that organized vegetable, and find what elements enter into its composition, and by a similar examination of soils can determine whether they contain the substances from which the plant must obtain its growth, or not. If they do not, the addition which will be efficient in promoting the growth being thus determined, chemical researches will again show the source whence it can be derived in the most economical manner. So also soils may contain compounds which, if the proper food of some plants, may be noxious to others; chemistry will detect these, and point out the means of neutralizing their injurious action.

Instead then of the decreasing fertility of soils which political economists assume, in opposition to some well known facts, or which the general experience of our own country would seem to demonstrate, we might infer that good soils could be kept up to their original state, and inferior soils improved until they became equal to the best: that nothing in fact except climate would oppose a limit to the approach of agricultural product to the maximum.

Such results, however probable in appearance, have been far from being attained, or even approached. Agriculturists rarely take the trouble to learn even the elements of science, and if the direct force of obvious example occasionally leads to the introduction of new machines and improved processes which are merely mechanical, those which chemical science would indicate are rejected as unintelligible and visionary. On the other hand the student of science can rarely or never acquire the practical skill, the knowledge of the mode of performing and directing agricultural labor, on which the practical farmer properly prides himself, and without which the best theory will lead to no profitable result.

In the application of chemistry to the analysis of vegetables, chemists have usually neglected to examine substances of the greatest importance which they know to exist in them, but which they were willing to consider as merely adventitious. Thus the person who reads a treatise on general chemistry, may rise from its perusal in the belief that plants contain no other essential elements but carbon, hydrogen, and oxygen, with the occasional addition of nitrogen; while a course of actual experiment could show earthy and saline substances, of large amount, wholly neglected in the estimate. Phosphorus too, which forms so large a portion of the mass of those animals whose whole subsistence is derived from the vegetable kingdom, is never named* among the elements of vegetables, yet it has on some occasions been detected in them, and there can be no doubt that if it were diligently sought it must be found in almost every case. When the gigantic bones of the elephant are known to consist, to so great an extent, of phosphate of lime, it would be vain to deny that the phosphorus and calcium exist in some state or other in the herbage he feeds upon, as well as the oxygen which forms the other ingredient of the phosphate. So far in fact from those substances which are neglected by chemists being unimportant in the constitution of plants, they must modify the manner in which the other elements combine; and although the vital action does in many cases compel them to enter into combinations in direct opposition to the ordinary laws of chemical affinity, we may in many instances safely attribute the great difference which exists among compounds, said to be of the same elements, to the very matters that are usually rejected in the examination.

> "It is said that putrescent manures serve for the nutriment of plants. But the same might be also stated in relation to substances which improve the soil, which furnish to it matters necessary to render it fertile; which impart to vegetables, the earth and saline compounds which enter as essential elements into their composition, texture, and their products. Such improving substances well deserve to be regarded as nutritive."
>
> "Thus lime, marl, and all the calcareous compounds employed in agriculture, since they furnish to plants lime and its compounds, which sometimes form half of the fixed principles of vegetables, ought also to be considered as aliments, or, which comes to the same, as furnishing a part of the substance of vegetables. Thus, again, wood ashes, pounded bones, burnt bones, which furnish to vegetables the calcareous and alkaline phosphates which compose a sixth part of the fixed principles of the stalks, and three-fourths of their seeds, ought well to be considered, and surely are nutritive."

> "What thus particularly marks the distinction between the manures which improve the soil (*amendemens*) and those which are alimentary (*engrais*) is, that the former furnish, for the greater part, the fixed principles of vegetables, the earths and salts, the latter the volatile matters which are abundantly diffused through the atmosphere, whence vegetables draw them by suitable organs: and what is more remarkable, is, that the vegetable by receiving the fixed principles of which it has need, acquires as we shall see, a greater energy to gather for its sustenance, the volatile principles which the atmosphere contains."—*Puvis.*

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* Probably the author refers to the necessary elements of plants, among the adventitious bodies; we believe it is usual to name the bodies which he has designated, e. g.—from a work now lying before us, take the following passage—"Besides the elements above named, that are essential to organized bodies, (carbon, oxygen, hydrogen, and nitrogen,) there are others, which are present in different cases, in greater or less quantity: such are phosphorus, sulphur, chlorine, iodine, bromine, potassium, sodium, calcium, silicium, magnesium, iron, manganase, &c. but generally they are in minute quantities," &c. Silliman's Chemistry, Vol. II. p. 391. Within these remarks, both organic kingdoms are included.—Ed. J. of S.

"The greater part of improving substances are calcareous compounds. Their effect is decided on all soils which do not contain lime, and we shall see that three-fourths, perhaps, of the lands of France are in that state. Soils not calcareous, whatever may be the culture, and whatever may be the quantity of manure lavished on them, are not suitable for all products, are often cold and moist, and are covered with weeds. Calcareous manures, by giving the lime that is wanting in such soils, complete their advantages, render the tillage more easy, destroy the weeds, and fit the soil for all products."

"These improving substances have been called *stimulants;* they have been thus designated because it was believed that their effect consisted only in stimulating the soil and the plants. This designation is faulty, because it would place these substances in a false point of view. It would make it seem that they brought nothing to the soil nor to plants, and yet their principal effect is to give to both, principles which are wanting."

Thus the main effect of calcareous manures proceeds from their giving on the one hand, to the soil the calcareous principle which it does not contain, and which is necessary to develope its full action on the atmosphere; and on the other hand, to vegetables, the quantity which they require of this principle, for their frame work, and for their intimate constitution. It would then be a better definition than that above, to say that to *improve* the soil, is to give to it the principles which it requires, and does not contain."—*Puvis.*

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"In the neighborhood of great cities, alimentary manures being furnished on good terms, may well vivify the soil; but animal manures cannot suffice but in a few situations and of small extent, and in every country where tillage is highly prosperous, improving manures are in use. The department of the north *(France,)* Belgium, and England owe to them in a great measure their prosperity. The department of the north (which is, of all Europe, the country where agriculture is best practised and the most productive,) spends every year upon two-thirds of its soil a million of francs in lime, marl, ashes of peat and bituminous coal, and it is principally to these agents, and not to the quality of the soil, that the superiority of its production is owing. The best of its soil makes part of the same basin, is of the same formation and same quality as a great part of Artois and Picardy, of which the products are scarcely equal to half the rate of the north. Neither is it the quantity of meadow land which causes its superiority; *that* makes the fifth part of its extent, and Lille, the best *Arrondissement*, has scarcely a twentieth of its surface in meadow: Avesne the worst of all, has one-third. Nor can any great additional value be attributed to the artificial meadows, since they are not met with except in the twenty-sixth part of the whole space. Neither can this honor be due to the suppression of naked fallows, since in this country of pattern husbandry, they yet take up one-sixth of the ploughed land, every year. Finally the Flemings have but one head of large cattle to every two hectares, a proportion exceeded in a great part of France. Their great products are due to their excellent economy in the use of manures, to the assiduous labor of the farmers, to courses of crops well arranged, but above all, we think, to the improvers of the soil, which they join to their alimentary manures. Two-thirds of their land receive these regularly: and it is to the reciprocal action of these agents of melioration that appears to be due the uninterrupted succession of fecundity, which astonishes all those who are not accustomed continually to see the products of this region."—*Puvis.*

The agriculture of adjacent parts of Belgium is even more instructive as an example. Those parts of that rich country which are now most remarkable for fertility, as for instance the *Pays de Waes*, were originally barren hills of blowing sand. They now yield a greater product than any other part of Europe. Great industry and labor have no doubt been expended in obtaining and applying putrescent manures, and in this region the clover husbandry had its rise; but with all this, no permanent fertility could have been given without the use of lime, and those substances which contain its compounds. At present a light friable mould, of greater depth than can be reached by the plough, and which is therefore occasionally trenched by the spade, covers the whole of the ancient *dunes*, and the whole country presents an aspect, of which no part of ours can even furnish an idea, with the exception of the garden grounds of the *Shakers* at Lebanon.

We fully concur with the opinion of M. Puvis in respect to the importance of earthy and saline matter, not only as forming a basis of proper character to support the plant, but as itself forming an essential part of the food. We on the other hand cannot but express our dissent from the opinion, which derives the other elements necessary to growth of plants wholly from the atmosphere. If he mean indirectly, through the intervention of the soil, he is to a certain extent right, for most of the water which is the vehicle of all their nutriment, yields at least one of their essential elements, and is itself incorporated with the plants, is derived from the atmosphere in the shape of rain and dew. But the gases it dissolves and carries with it, and which yield the carbon and part of the hydrogen of plants, are all derived from the decomposition of organic matter in the soil itself. When therefore we can find, in the absorption of water by the roots—its ascent in the form of sap—its elaboration in the leaves, where so far from an absorption from the atmosphere taking place, oxygen is evolved—in the subsequent descent of the altered sap in the form of gum, resin, &c. a sufficient reason for the supply of the parts M. Puvis seeks in the atmosphere—we are compelled to dissent from his conclusion. There is one curious fact in connexion with this subject, that we have never seen mentioned. It is obvious that while lands still retain a large quantity of vegetable matter, arising as it may, from their having been for ages in the state of forest, little benefit is to be hoped from putrescent manures, while there may be earthy substances essential to the growth of particular plants, which the soil does not contain. In such a case earthy manures are likely to be extremely serviceable.

The practical farmer in some parts of our country, finding that in a new soil, putrescent manures injure his crops, carts them out upon frozen rivers, in order that they may be carried away when the streams thaw. He thus loses all recollection of the European tradition of the necessity of restoring vegetable or animal matter to the soil, and continues a cultivation growing yearly more exhausting, until his land will no longer afford him a subsistence. His successor coming from a longer settled district, or from an European country, trusts wholly to putrescent manures, and is astonished that they often fail in their effects; but that an inert earthy matter should in some cases be a substitute for organic manure, and in others should be absolutely necessary to make it efficient, he will not believe, and laughs at the idea of carting an absolutely barren soil to an unproductive field. The earlier settler, who thinks no soil worthy of cultivation which demands any manure, would be even more astonished, were he told, that by the use of a small quantity of a substance which his experience tells him destroys vegetation, he might have easily maintained his lands in their original fertility, and instead of losing his whole labor in clearing the soil, have continued to reap crops equal to the earlier ones, whose prospect tempted him to that arduous task. Yet these propositions are strictly true.

One only mineral manure has been of any extended use in our country, namely the sulphate of lime, usually called plaster of Paris. This was luckily forced into notice by scientific farmers, and produced such obvious effects that the most skeptical could not doubt. Yet the reasons of its benefits are not generally understood, the causes of its failure in some positions not accounted for, and the injury that an unskilful use of it may produce, is rarely guarded against.

The agriculture of America has proceeded from three distinct centres, and may be divided into three distinct and separate characters. The settlers of New England were thrown upon a bleak shore, incapable of yielding any valuable agricultural product for export. They found and adopted the culture of maize as practiced by the Indians; this consisted in planting it in hills, each of which was manured by one or more fishes; and unable at first to see its value as a fallow crop, repeated it in continual succession upon the same field. To this they added the culture of European corn of various descriptions, following without alteration the husbandry introduced by the Romans into Great Britain, and which is described almost indentically in the Georgics of Virgil. With a less command of labor, however, the fallow were less perfect than in England, and presented rather the aspect of plantations of weeds, than of the naked pulverized soil which ought to characterize them. Wheat was first attempted, but gradually abandoned as unprofitable; rye followed, and is still cultivated, while a great improvement has taken place in making it, or oats, follow corn, and thus introducing the rotation of crops. The failure of wheat was in New England ascribed to any thing but the true cause; and it has been usual to lay the blame to the presence of the barberry bush. This indeed infests the fields from which wheat is banished, but is no more than the natural growth of a soil from which the earthy matter necessary to the nutriment of wheat is exhausted. This eastern mode of farming has derived great improvement from the introduction of sown meadows instead of naked fallows, and the climate admits of grazing them with benefit to the soil rather than injury. At a distance from the sea, clover has been introduced for this purpose, and has by the aid of plaster extended its beneficial influence along the southern shore of the great lakes, almost to the Mississippi.

It is to this lucky accident, as it may in fact be termed, that it is owing that the more newly opened regions in the northern states have not depreciated as much as those which were cultivated more early. Still, the habits of the pioneers of civilization, of eastern origin, are such as to make sad havoc with the native bounty of the earth.

The settlers of Virginia, on the other hand, found in their soil and climate the capacity of yielding tobacco, which formed an article of such value, as to dispense with their raising any other, for by its sale they could provide themselves even with bread stuffs. Not only did it do away with this as a necessity, but it furnished them with the means of purchasing slave labor, by which they were enabled to increase the extent of ground brought into cultivation, in a ratio far greater than was at first attempted in the eastern states. While in the latter regions, the settlers were at first collected in villages and hamlets, around which their arable lands were opened at the least possible distances, and every consideration of interest led the inhabitants to attempt to keep them in tolerable condition, the settlers of Virginia, after the first struggle with the natives was over, spread themselves in separate plantations at great distances from each other. Each planter took into possession an extensive district of wood-land, of which he cleared as much as his slaves were able to cultivate. So soon as by a continual succession of hard cropping with the same article, the power of raising tobacco was exhausted, new woodland was cleared and brought into cultivation; and thus in the older regions there has been no single acre of land of tolerable promise, that has not at some period or other been subjected to the plough. The virgin soil having been thus completely explored, it remained to abandon the country altogether, or bring it back to cultivation by enriching manures, and in the manner of applying, the proposed remedy became almost as fatal as the disease itself. The putrescent manures furnished by the whole stock of a plantation were lavished upon a few acres, and applied to the continual cultivation of the favorite staple, until they were again exhausted; and thus in succession, until a second round of ruinous cropping had been completed.

As the staple fell in value, from the increased population employed in its culture, Indian corn and wheat became objects of attention; but they were merely secondary, and did not enter into rotation with tobacco. Were we to hazard an opinion founded upon analogy, we should feel almost certain that tobacco well manured would form a substitute for a fallow crop, and might, in a well planned rotation, impair in no degree the native fertility of a soil. We have ascertained, in fact, that it is an admirable preparation for wheat; but the temptation to continue the tobacco culture is such, that it is rarely intermitted until the land becomes a *caput mortuum*.

The same system has been pursued in all the southern states, which may in this respect be considered as colonies of Virginia, and in all have the same consequences inevitably followed; immense products at first, in consequence of the intrinsic value of the peculiar staple, whether cotton or tobacco; improvident expenditures, arising from the difficulty of distinguishing what part of the annual income was in fact an encroachment upon the capital; and finally, impoverishment or ruin. To the latter event the large families of slaves, which the apparent profits of the earlier culture induced the planters to acquire, contribute in no small degree, as well as their disproportionate increase in a state of being free from all care and anxiety. This state of things is well described by Mr. Ruffin, in one of his notes.

"A gang of slaves on a farm, will often increase to four times their original number in thirty or forty years. If a farmer is only able to feed and maintain his slaves, their increase in value may double the whole of his capital originally vested in farming, before he closes the term of an ordinary life. But few farms are able to support this increasing expense, and also furnish the necessary supplies to the family of the owner—whence, very many owners of large estates in lands and negroes, are throughout their lives too poor to enjoy the comforts of life, or to incur the expenses necessary to improve their unprofitable farming. A man so situated may be said to be a slave to his own slaves. If the owner is industrious and frugal, he may be able to support the increasing number of his slaves, and to bequeath them undiminished to his children. But the income of few persons increases as fast as their slaves, and if not, the consequence must be, that some of them will be sold that the others may be supported; and the sale of more is perhaps afterwards compelled, to pay debts incurred in striving to put off that dreaded alternative. The slave at first almost starves his master, and at last is eaten by him—at least, he is exchanged for his value in food."

The waste of productive capital due to the use of slave labor, does not appear in this statement. By the estimate of Mr. Ruffin himself, the annual *wages* incurred by the employment of a slave amount to $38; the whole of the expenses to $86 50. By the account of one of his southern correspondents, in the Farmers' Register, an agricultural hired laborer in the state of Rhode Island does the work of 2½ slaves, and his wages and food we presume will not cost his employer more than $173. The northern farmer, therefore, saves one fifth; but it is, in addition, to be recollected, that the southern planter must support the children, the aged, and females who can do no work. We therefore think we are safely warranted in saying, that every piece of agricultural labor performed by a slave in a southern state, costs one-half more than if performed in an eastern state by a freeman. The difference, indeed, would not be perceptible, if they labored side by side, for the freed negro or white hireling would disdain to work in such a case; but as the comparative result between different portions of our country, it is unquestionable. The effect upon the general prosperity is, however, far greater than would appear from the comparison, for every laborer in the eastern states saves a part of his wages, to add to the national wealth; the children, the women, find profitable occupations, and thus a barren county of New England, in which there may not be a single wealthy individual, may notwithstanding possess a far greater collective wealth than an equal surface of the richest cotton region in the southern states.

The settlers of Pennsylvania commenced the cultivation of that state under different circumstances, and with different views from those either of the east or of Virginia. Penn's plan made cities or boroughs, the seats of traffic and markets of produce, the *nuclei* of his agricultural settlements, and by a mutual dependence thus created, fixed the agriculturist in the neighborhood of the merchant and manufacturer. The very state of things which a slow course of events has brought about in New England, was contemplated by that enlightened proprietor from the first. The dairy and the beeve were therefore the staples, and other products became the accessories; thus it has happened, that the farmers of the neighborhood of Philadelphia, are the only settlers of English blood, who have resisted the migratory habits of other parts of the country. In that neighborhood, the original fertility has been kept up by the manure yielded by the stocks of cattle which formed the basis of the system, and that which is afforded by the stables and streets of the city. A similar dread of change influenced the Germans, who followed the Quakers, in the occupation of the more remote districts of Pennsylvania; and while bread stuffs naturally became the only profitable objects of culture, they avoided the exhaustion which their growth produced in other districts, by a most valuable secret they brought with them from Europe. We call it a secret, for those of other blood, who see it used in their presence, do not discover its value. This is neither more nor less than the use of lime. By this simple but efficient aid, the farms of Pennsylvania have generally maintained their original character for fertility, and in some places have increased in products, beyond the early crops that are given by the proverbial energy of a virgin soil. To show how slowly an agricultural process, however valuable, passes from one race of settlers to another, we may mention what we ourselves saw, during the last summer, in Hunterdon county, New Jersey. The southern part of this county is settled by Germans, who have entered from Pennsylvania; the northern, by those of various races who have mounted the valley of the Raritan. The soil, in many places, is to appearance identical, being formed by the decomposition of the red shale; the Germans, by the use of lime, raise from thirty to forty bushels of wheat per acre, and their other products are in proportion; the settlers of Yankee and Dutch blood, are happy to get from fifteen to twenty. We hope, for the sake of our argument, that the same German race has carried the same practice along with it, in its progress through the valley of Virginia to North Carolina; for in the last named state we noticed a contrast even stronger than the one we have stated. After travelling for many miles through wastes of old fields, we entered the German settlement of Salem, which, without any perceptible change in the original character of the soil, presented the rich appearance of Pennsylvania.

In the foregoing statement, we have not included the settlers of the Dutch province of the New Netherlands, not because they brought with them little agricultural skill, but because their example has been of little influence upon the present agriculture of the United States. It is, however, but justice to them to mention, that many of them being Protestants, expelled from the southern Netherlands by the persecutions of the Spanish crown, the modes, implements, and practice of husbandry which they introduced, were the very best which then existed, and that although part of these were necessarily abandoned under the new circumstances in which they were placed, their implements in particular were superior, if applied to light soils, such as those of their native Brabant, to any brought to America by other races. Long Island, to which these were well fitted, bore, in consequence, previous to the Revolution, the well merited epithet of the garden of the colonies. But the Flemish, Walloon, and Frisian blood was not excited by the same inventive spirit as the Anglo-Norman; and unable to accommodate themselves to new circumstances, the Dutch settlers of rocky and rugged districts fell behind the New England yeomanry in agricultural skill.

We have called the use of lime a secret: it was not only so to the practical farmer, but to the man of science; for even the researches of Davy, who was well aware of its importance, have not completed the theory of its action. It is, therefore, with no small pride, that we can refer to a countryman of our own, as having finished what the most acute researches of European chemists had left unaccomplished. This credit is due to Mr. Ruffin, and with him as a guide, and with some little aid from the article of which he is the translator, we shall endeavor to exhibit, in a succinct form, the theory of calcareous manures.

In order to make this complete, we shall be compelled to state facts, which to the majority of the readers of this journal will appear trite and hacknied. As our main object, however, is to call to this subject the attention of intelligent farmers, who may not recollect familiarly the elements of science, our more learned readers must pardon us, if we devote a few lines to matters in which they need no instruction.

Pure lime is so rarely found in nature, that it may be stated as a general rule, that it can be obtained only artificially, in the process of calcination, as practiced in preparing limestones for making mortar. Thus obtained, lime retains the original figure of the stone from which it is manufactured, is acrid and caustic, soluble in small proportion in water, and possesses alkaline properties, that is to say, it is capable of neutralizing acids, and forming with them substances of the class to which chemists give the name of salts. Of these salts, those most important to the agriculturist are, the carbonate, which forms the principal part of common limestones, chalk, and the shells of testaceous fish; sulphate of lime, which in combination with water constitutes gypsum or plaster of Paris; and phosphate of lime, which is the basis of the bones of animals, and has been found in the ashes of plants.

When exposed to air, lime attracts carbonic acid, and passes back to the state whence it was reduced by fire, but loses its figure and falls slowly to powder. When water is thrown on lime, it undergoes the process called slaking, and falls rapidly to powder, producing a hydrate, which is a combination with water. This powder, when exposed to the air, also rapidly passes into carbonate of lime. Both lime and its combination with water promote the decomposition of animal and vegetable substances, and absorb the gases which are generated by their putrefaction. The latter property is also possessed by the carbonate of lime, when in a state of fine powder, or even when it merely exposes a large surface to their action, and although rarely mentioned by chemists, and in itself purely mechanical, is of the most familiar character, being habitually called into use in our domestic economy, to correct offensive effluvia, and absorb the miasmata which produce disease.

The two other earths, as usually found in soils, (silica the base of flint and sand, and alumina, the base of clay,) appear to possess this mechanical property, either not at all or in a very inferior degree.

Lime, when mixed with these earths, gives them this property, and at the same time modifies their characters in a most remarkable manner. Silica, which has no attraction for moisture, is rendered retentive of water by lime; and clay, which forms, with abundance of water, a plastic paste, and hardens, on partial drying, into a tough clod, loses its plasticity and is rendered friable.

Lime in the form of carbonate, still possesses these mechanical properties, and thus limestone, or shells even coarsely powdered, will absorb the gases of putrescent bodies, render sand more retentive of moisture, and convert a stiff clay into a friable loam.

The alteration of the mechanical character of soils, is the first and most obvious effect produced by lime. For this purpose, it may be applied either caustic, as prepared by burning, merely pulverized from chalk or limestone, or in the form of disintegrated shells. The caustic form is more rapid, but not more sure in its action; and the burning of limestone, when this is the object, is no more than a cheaper mode of reducing it to powder, through the intervention of slaking.

When the soil contains inert vegetable matter, which has ceased to undergo fermentation, caustic lime will promote the putrefactive process, and prepare it for the food of plants. If the process of fermentation has stopped after the acetic stage, and left the soil acid, either caustic or carbonated lime will neutralize the acid; it will not only thus prepare the soil to bear plants, which would not otherwise grow, but, by removing the antiseptic action of the acid, permit other vegetable matter to undergo putrescense, and thus supply an appropriate food for plants.

The principal part of the food of all plants is derived from the gases and soluble matters furnished by the decomposition of organic bodies. These gases tend to expand and distribute themselves through the atmosphere, with the exception of such as are soluble in the moisture of the soil, or such as the earth may retain by mechanical attraction. Lime and its compounds have by far the greatest powers in the last respect, and thus, if a soil is calcareous, it will retain these elements of fertility, and give them out only as they are required by the wants of the vegetables that grow upon it; it will be but little injured by exposure to the air when uncovered, and will retain its fertility longer. It will receive a greater quantity of animal and vegetable manure without poisoning the plants by excess of nutriment, and the effects of a given quantity will be longer sensible. If the soil contain no carbonate of lime, this property may be given artificially by manuring with slaked lime, which rapidly becomes carbonated; with powdered limestone or chalk; with marl in the proper sense of the term; or with recent or fossil shells.

Here it might at first be imagined, that the more free a soil is from calcareous matter, the greater the quantity of carbonate of lime which might be applied; but this is exactly the reverse of what is pointed out by experience. We do not consider that this fact is difficult of explanation. Lime cannot alter the mechanical texture of soils, nor give to the whole mass, the property of absorbing gases, except by entering into chemical combination with their other constituents. Such changes of character are not only the universal consequence of chemical action, but the strongest proofs of its having taken place. The case before us, is therefore, no more than one of a large class in chemistry, where it is necessary to apply a chemical agent much diluted at first, while, after the action has once commenced, the strength of the agent may be gradually increased with advantage; and in the same way, upon poor and exhausted soils, a large dose of calcareous matter may produce no benefit, or even positive injury, while a lighter dressing may produce immediate good effects, and prepare the soil to receive with advantage, larger quantities. The addition of putrescent manures, enables the lands to receive a larger dose of lime even from the first, and the successive dressings may in like manner be increased if green crops are ploughed in, or stable manure added. This is also consistent with theory, for the surplus lime may be advantageously employed in absorbing the gases generated by the decomposition. Still these are facts that, although we may explain them in conformity with chemical principles, could not readily have been predicted before hand.

One curious fact was observed by Mr. Ruffin, in his chemical analyses of the soils of Virginia, namely, that even in regions where the rock, by whose decomposition the soil was formed, was limestone, not only did no carbonate of lime manifest itself by effervescence with acids, but no precipitate was formed by the tests of lime in the acid solution. He could not admit that, in such soils, lime was absolutely wanting, and therefore inferred, that it was in such a state of combination, as to be neither soluble in water, or decomposable by nitric acid. Such a combination is the oxalate of lime, but as he has made no direct inquiry into its presence, and some of his correspondents have questioned the probability of such an union existing, he has, with the true spirit of an inductive inquirer, modified his assertion until farther proof be obtained. We, however, do not think that so much modesty was necessary, for it can be shown that the formation of oxalic acid, and its consequent combination by superior affinity with lime, whatever may be its previous state of combination, are at least probable, if not certain.

The formation of nitric acid in calcareous soils, by the absorption of its two elements from the atmosphere, is not only rendered probable by the presence of nitre and nitrate of lime in the soils of many warm countries, but made certain by the construction of artificial nitre beds in France, when the foreign supply was cut off by the preponderance of the British navy. When this acid is formed in a soil abounding with vegetable matter, not yet decomposed, as is the case with many of our newly opened regions, oxalic acid *must* be formed.

Such then are the properties of lime, considered as a constituent of the soil: to bring its texture to that best suited for tillage, and for conveying the moisture, which is the vehicle of the food of plants, neither in excess or in defect; to condense and store up that gaseous food until needed; to promote the decomposition of inert organic matter; to neutralize acidity, and counteract its antiseptic action, thus removing a noxious principle, and opening a new supply of vegetable food.

One other use of lime in soils remains to be mentioned, and this does not seem to have occurred to Mr. Ruffin, but is strongly urged by M. Puvis, in a passage we have quoted. The ashse of all plants, when lixiviated, are composed eithre of the pure earths or earthy salts; of the latter, those of lime are by far the greatest in quantity, although probably altered by the fire from their original state. Thus, wood ashes contain the carbonate, sulphate, and phosphate of lime. In addition, the liquor by which the alkaline matter is separated by lixiviation carries with it earthy matter, which is rendered soluble by the alkali. Now it cannot be doubted, that if this alkaline, earthy and saline matter is not contained in the soil, the plant must be stinted in its growth or actually die. Thus to many plants, lime, or some of its compounds, forms an essential article of food; it may be required in less quantity than carbon, hydrogen, oxygen, and water, but is not the less necessary to their growth. Now, former analyses did not show that lime and its compounds are contained in the stalks and seeds of the cereal gramina; but the existence of earthy matter, undissolved by water or alcohol, or left as a rediduum of combustion, was well known. More recent investigations have shown, that lime is one of the constituents of this residuum. Silex certainly exists in the stalks, and particularly at the joints of the gramina, being in some actually visible to the naked eye.

It is upon the same principle only, namely, that it serves as the food of plants, that we can account for the effects of gypsum upon certain crops, which, in any other mode of viewing them, would appear miraculous. This sulphate of lime, if merely ground, has no attraction for moisture, and, if burnt, would rather absorb it from the soil than the air; it cannot therefore act, as some have supposed, to increase the deposite of dew; it is so sparingly soluble in water, and so inert, that it cannot act as a stimulus, nor is it certainly followed by exhaustion, as all stimuli must be. But although sparingly soluble, it is still conveyed by water, into the bodies of plants, although in small quantities, and as that water undergoes the chemical changes, which we know are induced by the vital action of plants, the sulphate of lime must be deposited in them, injuriously perhaps to some, but as a necessary food to others. Thus, it has been found that the ashes of clover, lucern, and many of those plants whose growth is known to be most certainly promoted by gypsum, uniformly contain sulphate of lime; it is, therefore, their essential and appropriate food. Some soils may contain it naturally—here an addition will not increase the crop of such plants; some may contain a substance which will decompose the sulphate, and thus prevent its action. The earth baryta will separate the sulphuric acid from lime, and thus may produce this effect; but this is so rare, that injury from this cause can hardly be anticipated. Oxalic acid will separate the lime from the sulphuric acid, and thus will not only render the application of gypsum inefficient, but will also set the acid free to act injuriously. But if the oxalic acid has been previously neutralized by lime, the sulphate remains unaltered, and is capable of aiding the growth of clover and other plants of the sort. In confirmation of this view of the subject, we may quote the experience of Mr. Ruffin. His soil would not produce clover, even with the aid of plaster; and this being known, he did not attempt to use it, until encouraged by a spontaneous and luxuriant growth of white clover. We may also state a fact, within our own knowledge. It is a general belief, that in the neighborhood of the sea, plaster is useless, and it has been so found in general on the Island of New York and in the adjacent county of Westchester; yet upon a narrow ridge of magnesian marble, which lies between the layers of gneiss and mica slate which form the greater part of this region, we have seen plaster used with great success.* Yet clover, when aided by putrescent manures, is a successful crop, on the gneiss, without the artificial aid of plaster; both this is readily accounted for, as sulphuret of iron is not rare, which being decomposed, and thus yielding sulphuric acid to combine with the lime of the feldspar, supplies the necessary food of the plant. In England, too, where a saline air, prevailing almost universally, is generally supposed to forbid the use of gypsum, there are calcareous soils on which it is beneficial, as in Kent, which is as much exposed to the blast of the sea as almost any part of the kingdom. Among the many advantages of calcareous manures, then, may be mentioned, as not the least, that it will prepare the way for the introduction of the clover husbandry, in regions where it would otherwise be impracticable.

Mr. Ruffin's own experience is limited to the regions of Virginia within reach of the tide, and to these his remarks are, with a just philosophical spirit, restricted; yet his extensive experience and accurate observation furnish the ground for a theory which must be useful, if properly understood and applied, in any district whatsoever.

The soils of this region were, on examination, found to be wholly destitute of calcareous earth, except a few isolated spots enclosed within them, which were observed to manifest, even to the eye, fragments of shells, and yielded lime on analysis. These spots were proverbial for their fertility, and remarkable for the fact, that on some of them a long continued succession of the same crop had been annually cultivated, without, absolute exhaustion. On a careful examination, Mr. Ruffin found that these shells, supposed to be the relics of Indian encampments, were the outcrop of fossil layers, and he succeeded in tracing these layers to his own land.

> "My use of calcareous earth, as a manure, has been almost entirely confined to that form of it which is so abundant in the neighborhood of our tide waters, the beds of fossil shells, together with the earth with which they are found mixed. The shells are in various states—in some beds generally whole, and in others reduced nearly to a coarse powder. The earth which fills their vacancies, and makes the whole a compact mass, in most cases is principally silicious sand, and contains no putrescent, or valuable matter, other than the calcareous. The same effects might be expected from calcareous earth in any other form, whether chalk, limestone, gravel, wood ashes, or lime, although the two last have other qualities besides the calcareous."
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> "During the short time that lime can remain quick, or caustic, after being applied as manure, it exerts (as before stated) a solvent power, sometimes beneficial, and at others hurtful, which has no connexion with its subsequent and permament action as calcareous earth."
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> "These natural deposits of fossil shells are commonly, but very improperly, call marl. These misapplied term is particularly objectionable, because it induces erroneous views of this manure; other earthy manures have long been used in England, under the name of marl, and numerous publications have described their general effects and recommended their use. When the same name is here given to a different manure, many persons will consider both operations as similar, and perhaps may refer to English authorities for the purpose of testing the truth of my opinions, and the results of my practice. But no two operations, called by the same name, can well differ more. The process which it is my object to recommend, is simply the application of calcareous earth, in any form whatever, to soils wanting that ingredient, and generally quite destitute of it; and the propriety of the application depends entirely on our knowing that the manure contains calcareous earth, and what proportion, and that the soil contains none." (p. 34.)

This being his object, he enforces the use of calcareous manures, both by example and a well grounded theory.

The comparative effects of the marl in various proportions, of stable and cow-pen manure, and of marl mixed with manure, were fairly tried, and tested with the product of land without addition. We have not time to enter into the detail of the operations, and of the several products. It is sufficient to say, that by the mixture of marl and and manure, the crop of corn was raised from twelve to thirty-six bushels per acre; by eight hundred bushels of marl, from twelve to an everage of twenty-three; by four hundred and fifty bushels of marl, from twelve to somewhat less than twenty seven; that the mixture and the last named dressing of marl alone, showed a subsequent increase when corn returned in a four years' rotation, while the others showed an average decrease; that the wheat crops were increased in about the same ratio; but that clover, which before had not grown at all, became a good crop on the marled patches. This was upon soil which had before been in cultivation. Similar results followed upon land newly reclaimed from the forest. The next important inference to which we shall refer, is the advantage derived from the use of gypsum, upon soils which have been dressed with marl. This inference was reached, by observing the effect of a layer of the fossil shells, which contained sulphate of lime.

On one point only are we compelled to dissent from Mr. Ruffin. He states it broadly as his belief, that a soil may be either so constituted naturally, or so improved by the artificial application of carbonate of lime, that it shall never thereafter need a farther supply. There will no doubt be a limit reached in both ways when an addition of lime will be injurious, but as this substance is in fact a necessary part of the nutriment of many plants, their growth will slowly remove it, and the time may at last come when a new supply will be necessary, to restore or retain the original natural fertility. But soils, thus prepared by nature or improved by art, may retain for long periods of time their power of giving value to the original vegetable matter in the soil, or the putrescent manures applied, either in the form of green crops or of stable manure, and the English saying, that no man need marl his field a second time, is founded on sound observation. Soils of such a character, either native or artificial, are to the husbandman, what labor saving machines are to the mechanic; they are in fact engines by which the greatest possible return may be obtained by the least expenditure of labor. No part of the seaboard of the United States, with the exception of small and isolated districts, present soils of this character. It is only after passing the first range of mountains that a limestone formation is met with. This, is or was, proverbial for its fertility, of which the Fishkill, Swetara, and Shenandoah valleys,are well known instances. The same formation can be traced to the valley of the Schoharie, in New York, and it is recorded by tradition to have had even a higher character than any of the others; its glory has however, departed, and the Genesee, which is a similar formation, now holds the rank in public estimation, the Schoharie once possessed. Both the valley of the Schoharie, and the vicinity of Lancaster, Pa., were occupied by German settlers; the former Palatines, the latter of more northern birth. The former were ignorant of the use of lime, the latter brought it with them, and being fortunately no chemists, saw no impropriety in applying it in small quantities, and at intervals, to a soil originally calcareous. The difference of the results, is an interesting illustration of the value of this manure. In the valley of the Schoharie, land tilled with equal industry and economy, will not command a fourth of the price of that of the vicinity of Lancaster.

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* It has been used, with entire success, on lands washed by the sea, at Stamford, in Connecticut, by the late Mr. Moses Rogers.—*Ed. Journal of Science.*

The experiments of Mr. Ruffin, were made, as we have stated, upon the soils of lower Virginia. He introduces his description of them in the following striking manner.

'"During several days of our journey, no spot was seen that was not covered with luxuriant growth of large and beautiful forest trees, except where they had been destroyed by the natives for the purpose of cultivation. The least fertile of their pasture lands, without seeding, are soon covered with grass, several feet in height; and unless prevented by cultivation, a second growth of trees rapidly spring up, which, without care or attention, attain their giant size in half the time that would be expected in the best soils in England."'

"If the foregoing description was met with in a"Journey through Hindostan," or some equally unknown region, no European reader would doubt that such soils were fertile in the highest degree—and even many of ourselves would receive the same impression. Yet it is no exaggerated account of the poorest natural soils in our own poor country, which are as remarkable for producing luxuriant growths of pines and broom-grass,as for their unproductiveness in every cultivated or valuable crop. We are so accustomed to these facts that we scarcely think of their singularity; nor of the impropriety of calling any lands barren, which will produce a rapid growth of any one plant. Indeed, by the rapidity of that growth, (or the fitness of the soil for its production,) we have in some measure formed a standard of the poverty of the soil.

"With some exceptions to every general character, the tide-water district of Virginia, may be described as generally level, sandy, poor, and free from any fixed rock, or any other than stones rounded apparently by the attrition of water. On much the greater part of the lands, no stone of any kind is to be found of any larger size than gravel. Pines of different kinds, form the greater part of a heavy cover to the siliceous soils in their virgin state, and mix considerably with oaks and other growth of clay land. Both these kinds of soils after being exhausted of their little fertility, by cultivation, and "turned out" to recruit, are soon covered by young pines, which grow with vigor and luxuriance. This general description, applies more particularly to the *ridges*, which separate the *slopes* on different streams. The ridge lands are always level, and very poor; sometimes clayey—more generally sandy, but stiffer than would be inferred from the proportion of silicious earth they contain, which is caused by the fineness of its particles. Whortleberry bushes as well as pines, are abundant on ridge lands, and numerous shallow basins are found, which are ponds of rain water in winter, and dry in summer. None of this large proportion of our lands, has paid the expense of clearing and cultivation, and much the greater part still remains under its native growth. Enough however has been cleared and cultivated in every neighborhood to prove its utter worthlessness, under common management. The soils of ridge lands vary between sandy loam and clayey loam. It is difficult to estimate their general product, under cultivation; but judging from my own experience of such soils, the product may be from five bushels of corn, or as much wheat, to the acre, on the most clayey soils, to twelve bushels of corn and three of wheat on the most sandy—if wheat were there attempted to be made.

"The *slopes* extend from the ridges to the streams, or to the alluvial bottoms, and include the whole interval between neighboring branches of the same stream. This class of soils, forms another great body of lands of a higher grade of fertility, although still far from valuable. It is generally, more sandy than the poorer ridge land, and when long cultivated, is more or less deprived of its soil, by the washing of rains on every slight declivity. The washing away of three or four inches in depth, exposes a steril subsoil (or forms a "gall,") which continues thenceforth bare of all vegetation; a greater declivity of the surface serves to form gulleys several feet in depth, the earth carried from which, covers and injures the adjacent lower land. Most of this kind of land has been cleared and greatly exhausted. Its virgin growth, is often more of oak, hickory and dog wood, than pine; but when turned out of cultivation, an unmixed growth of pine follows. Land of this kind in general, has very little durability; its usual best product of corn, may be for a few crops, eighteen or twenty bushels, and even as much as twenty-five bushels, from the highest grade. Wheat is seldom a productive or profitable crop on the slopes, the soil being generally too sandy. When such soils as these, are called rich or valuable, (as most persons would describe them,) those terms must be considered as only comparative; and such an application of them proves that truly fertile and valuable soils are very scarce in Lower Virginia.

"The only rich and durable soils, below the falls of our river, are narrow strips of highlands along their banks, and the lowlands formed by the alluvion of the numerous smaller streams, which water our country. These alluvial bottoms, although highly productive, are lessened in value by being generally too sandy, and by the damage they suffer from being often inundated by floods of rain. The best highland soils, seldom extend more than half a mile from the river's edge, sometimes not fifty yards. These irregular margins are composed of loams of various qualities, but all highly valuable, and the best soils are scarcely to be surpassed, in their original fertility, and durability under severe tillage." (pp. 11, 12.)

"The simple statement of the general course of tillage, to which our part of the country has been subjected, is sufficient to prove that great impoverishment of the soil, has been the inevitable consequence. The small portion of rich river margins, was soon all cleared, and was tilled without cessation for many years. The clearing of the slopes was next commenced, and is not yet entirely completed. On these soils the succession of crops was less rapid, or from necessity, tillage was sooner suspended. If not rich enough for tobacco when first cleared, (or as soon as it ceased to be so,) land of this kind was planted in corn, two or three years in succession, and afterwards every second year. The intermediate year between the crops of corn, the field was "rested" under a crop of wheat, if it would produce four or five bushels to the acre. If the sandiness, or exhausted condition of the soil, denied even this small product of wheat, that crop was probably not attempted; and instead of it, the field was exposed to close grazing, from the time of gathering one crop of corn, to that of preparing to plant another. No manure was applied, except on the tobacco lots; and this rotation of a grain crop every year, and afterwards every second year was kept up as long as the field would produce five bushels of corn to the acre. When reduced below that product, and to less than the necessary expense of cultivation, the land was turned out to recover under a new growth of pines. After twenty or thirty years, according to the convenience of the owner, the same land would be again cleared and put under similar scourging tillage, which would then much sooner end as before, in exhaustion. Such a general system is not yet every where abandoned, and many years have not passed since such was the usual course on every farm. How much our country has been impoverished during the last fifty years, cannot be determined by any satisfactory testimony. But, however, we may differ on this head, there are few who will not concur in the opinion, that our system of cultivation has been every year lessening the productive power of our lands in general, and that no one country, no neighborhood, and but few particular farms have been at all enriched, since their first settlement and cultivation. Yet many of our farming operations have been much improved within the last fifteen or twenty years. Driven by necessity, proprietors direct more personal attention to their farms—better implements of husbandry are used, every process is more perfectly performed—and, whether well or ill directed, a spirit of inquiry and enterprise has been awakened, which before had no existence. Throughout the country below the falls, and perhaps thirty miles above, if the best land be excluded, say, one-tenth, the remaining nine-tenths, will not yield an average product of ten bushels of corn to the acre; although that grain is best suited to our soils in general, and far exceeds in quantity, all other kinds raised. Of course the product of a large proportion of the land would fall below this average."

"Such crops cannot in many cases remunerate the cultivator. If our remaining woodland should be at once brought into cultivation, the gross product of the country would be greatly increased, but the net product, very probably diminished—as the general poverty of these lands would cause more expense than profit, to accompany their cultivation under the usual system. Yet every year we are using all our exertions to clear woodland, and in fact, seldom increase either gross or net product—because nearly as much old exhausted land is turned out of cultivation, as is substituted by the newly cleared. Sound calculations of profit and loss would induce us to reduce the extent of our present cultivation, by turning out every acre that yields less than the total cost of its tillage." (p. 12.)

The green sand formations which yield the marl of Mr. Ruffin, are to be found also in Maryland and in Jersey. In the latter state, its use was commenced as early as 1805, by the Rev. John Singleton of Talbot county, and has been continued to the present time with great success. His example has been followed by his neighbors in the same county, and the practice has extended into Queen Ann's; but it does not appear that it has yet been introduced on the western shore of the Chesapeake. In Jersey, the county of Monmouth, at one time considered almost irretrievably barren, has been raised to great productiveness by the use of this manure.

This formation, or one analogous in its fertilizing character, is however of no frequent occurrence; it therefore remains for us to inquire whether other forms of calcareous matter may not answer the same purpose. Such is the extensive diffusion of lime in nature, that there are few or no regions where it cannot be procured. Even in primitive regions, beds or veins of granular carbonate of lime, are of occasional occurrence, and in those which are alluvial, the remains of recent shell fish are not wholly wanting. Much, however, will depend, in the success of its application, upon the quantity which is required, as it may happen that when this is considerable, the expense of transportation may equal, or more than counterbalance the benefit it is calculated to produce. This question can be solved only by reference to the practice of those countries, in which lime has been applied with success.

In the north of England, and in Scotland, the use of lime as a manure may almost appear to be excessive. Two hundred bushels per acre are often applied to sandy soils, and from three to four hundred on clay. Dressings of this amount are renewed once in every term of twenty one years. This high rate of application could not however be practised upon land not yet habituated to its use, and would in most parts of the United States, be too costly to yield any profit.

In England the lime is usually laid in small heaps on the fields, in its caustic state, and spread as soon as it becomes air-slaked.

In the department of l'Ain in France, the dressings are about eighty bushels to the acre, and are applied as a preparation for every grain crop.

The lime here, is also laid in heaps in its caustic state, but these are immediately covered with earth, which remains until the lime is slaked, when the earth and it are intimately mixed, and after having rested for a fortnight, are again thoroughly incorporated. In this state they remain for another fortnight, when the whole is uniformly distributed over the ground.

In Flanders the quantity of lime applied, is from forty to fifty bushels to the acre, and the dressing is not repeated oftener than once in ten or twelve years. The lime is usually mixed with the ashes of bituminous coal, or of turf, or formed into a compost with other manures.

In the department of La Sarthe, the lime is applied once in three years, and in the form of compost.

"For that, there is first made a bed of earth, mould or turf, of a foot, or thereabout, in thickness. The clods are chopped down and then a layer of unslaked lime is spread over them, at the rate of a hectolitre for twenty cubic feet, or a ton to forty five cubic feet of earth.* Upon this a second layer of earth, of the same thickness as the first, is placed; on this is laid a second layer of lime; and the whole covered by a layer of earth. If the earth is moist, and, the lime recently burnt, eight or ten days will suffice to slake it completely. Then the heap is cut down and well mixed—and this operation is repeated afterwards before using the manure, which is delayed as long as possible, because the power of the effect on the soil is increased with the age of the compost, and especially if it has been made with earth containing much vegetable mould."—*Puvis.*

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* These two quantities do not correspond, but as we have not the original to refer to, we are compelled to take the translation as we find it.

The quantity used in La Sarthe is not more than twelve bushels to the acre, and is laid upon the land in alternate rows, with barn yard manure. In the opinion of M. Puvis, this method, although the least expensive, is the best, and it may be said to be within the reach of almost every American agriculturist.

The advantage of the use of lime may be stated in a few words; it is an essential part of the seed of wheat, and that valuable grain will not grow in any soil which does not contain it. It may, therefore, be reasonably hoped that the culture of this plant may, by the aid of lime, in this comparatively cheap mode, be restored in those districts whence it has long been banished.

In the United States the use of lime is limited to the districts into which the descendants of the Germans, who settled in Pennsylvania, have introduced the method they brought from their native country. It is usual to apply from thirty to forty bushels per acre, and in some instances one hundred bushels have been used to advantage. The limestone, by the analysis of Dr. Cooper, yielded in some instances as much as 16 per cent. of magnesia. It therefore comes into the class of magnesian limestones, the employment of which requires caution, for this earth absorbs carbonic acid from the atmosphere much more slowly than lime, and so long as it is uncombined may be injurious to plants.

The high price of grain in Great Britain, during the long wars of the French Revolution, acted as a stimulus upon the use of inferior soils, and these were rendered arable by the use of lime; but the improvement thus produced has been permanent, and although a fall in the price of agricultural products may have lowered rents, or ruined those who had contracted to pay high ones, we have heard of no instance of its becoming expedient to abandon the soils once brought into tillage by the aid of lime. The most remarkable fact of all is, that many of the newly reclaimed lands, in districts formerly considered as sterile both by nature and climate, were raised to a higher value than those of ancient fame for fertile soil and favorable skies. Thus, twenty years since, the rents of Northumberland, Berwick and Dumfries, were higher, per acre of arable soil, than those of Gloucestershire, and we were witnesses of the migration of tenants, from the northern to the southern region, at the request of landlords, who wished to introduce the Scottish husbandry, of which lime is the main support, into the fertile vales of the Severn.

We cannot conclude, without recommending the perusal of the works whose titles stand at the head of this article, to the attention of every American landholder. A skilful application of the principles they illustrate, would go far to check the annual decrease in fertility, which takes place in many of our districts; a decrease which has already made some of the regions once most productive in bread stuffs, importers of that necessary element of existence, and which subjects us most deservedly to the reproach of being unable to retain the blessings which Providence has showered with a lavish hand upon our country.

One other important consideration requires notice, and this is the change in healthfulness which the application of calcareous earth to soils abounding in vegetable matter, is likely to produce. Mr. Ruffin cites facts in which he is corroborated by M. Puvis, which would almost warrant the conclusion, that this will be an efficient remedy for the malaria, whose influence is extending itself over every part of our middle and southern seaboard. There are indeed causes, such as stagnant waters, mill ponds, and rice cultivation, which are beyond its reach; but there are other cases, where if there be any reliance on the usual theory of the causes, calcareous manures ought to be efficient in checking an infliction, which drives the white population, during the summer and autumnal months, from many of the fairest portions of the United States, and in others materially shortens the averege duration of human existence.

From Loudon's (English) Gardener's Magazine.

An Essay on Calcareous Manures. By Edmund Ruffin. Small 8vo, pp. 242. Petersburg, Lower Virginia, 1832.

The object of this Essay, Mr. Ruffin informs us, is to investigate the peculiar features and qualities of the soils of the tide-water districts of Lower Virginia; "to show the causes of their general unproductiveness; and to point out means, as yet but little used, for their effectual and profitable improvement." The sterility of these soils Mr. Ruffin has ascertained to arise from their being destitute of calcareous earth, and from their being injured by the presence of vegetable acid.

After two chapters on earths and soils generally, and on the soils and state of agriculture in the tide-water districts of Virginia, the author treats of the different capacities of soils for improvement, and discusses the following propositions:—

1. "Soils naturally poor, and rich soils reduced to poverty by cultivation, are essentially different in their powers of retaining putrescent manures: and, under like circumstances, the fitness of any soil to be enriched by these manures, is in proportion to what was its natural fertility.

2. "The natural sterility of the soils of Lower Virginia is caused by such soils being destitute of calcareous earth, and their being injured by the presence and effects of vegetable acid.

3. "The fertilizing effects of calcareous earth are chiefly produced by its power of neutralizing acids, and of combining putrescent manures with soils, between which there would otherwise be but little, if any, chemical attraction.

4. "Poor and acid soils cannot be improved durably or profitably, by putrescent manures, without previously making them calcareous, and thereby correcting the defect in their constitution.

5. "Calcareous manures will give to our worst soils a power of retaining putrescent manures equal to that of the best; and will cause more productiveness, and yield more profit, than any other improvement practicable in Lower Virginia." (p. 30.)

These propositions contain the marrow of the Essay, which is closely reasoned, and, in several particulars, original. Mr. Ruffin has the merit of first pointing out that there can be no such thing as a naturally fertile soil, without the presence of calcareous earth; but, where this earth is present, the soil, however exhausted it may have been by culture, will, when left to itself, after a time regain its original fertility: that soils which contain no calcareous earth are never found naturally fertile, except mosses, or beds of vegetable matter, which are not properly soils: and that all that art can do to them, exclusive of adding calcareous earth, is, to force crops by putrescent manures; but that, when these manures are withheld, the soil will speedily revert to its original sterility. Mr. Ruffin observes that no agricultural or chemical writer ever denied these facts; but he asserts, and we think with truth, that by not one of them have they ever been distinctly stated. We are not quite certain as to Grisenthwaite, but we are so as to Kirwan, Dundonald, Davy, Chaptal, and other agricultural chemists of the Continent. Mr. Ruffin allows that it might be inferred from the ingredients exhibited by the analyses of fertile soils, as given by these chemists, that calcareous earth was an ingredient essential to permanent fertility; but still none of them have ever distinctly said so. We shall probably examine the work more in detail hereafter: in the mean time, it is due to Mr. Ruffin to state it as our opinion that he has performed a very important service to the scientific agriculturist in this country, as well as in America.

THE SALIVATING QUALITY OF GREEN CLOVER, AND CLOVER HAY.

To the Editor of the Farmers' Register.

May I inquire, through the Register, of you, or some of your subscribers, if clover has any inherent property whichcauses it sometimes to salivate? If so, what is it? and how may the cause which produces this effect be neutralized? When it salivates in the green state, will it always do it in the dry or cured?

It was my opinion that clover hay would never salivate; but my crop of last year, (cut from river bottom when the clover was in full bloom, cured in slender tall cocks, or mostly so, leaves and blossoms pretty well preserved, and but little altered,) is almost worthless as a feed for either horses or cattle. Both will eat it well for a few days, then appear to become sick, and then refuse it altogether if they can get any thing else. If confined to it, they become salivated. A part of the crop was salted when it was stacked, but little or no advantage was derived from it, except that sheep preferred that salted to any kind of hay I had.

A SUBSCRIBER.

From the Tennessee Farmer.

CULTIVATION OF SWEET POTATOES.

In the cultivation of every thing, we should consider of what kind it is, to what climate it belongs, and what kind of soil is best adapted to its production. From a neglect to consider these things, many unsuccessful efforts have been made to raise the sweet potato. The sweet potato is a native of a warm climate, and of a light sandy soil. We should then, as far as possible, endeavor to combine these two things, by a judicious selection of a piece of ground upon which to raise them. I will give you the plan which I have adopted in raising sweet potatoes, which has been very successful. Perhaps some who have heretofore failed, may be enabled to succeed better, by adopting it.

Some time in March, when I think the hard frosts are over, I take my potatoes from the cellar, where they have been kept through the winter. I prepare a bed in my garden, by levelling the surface of the ground: I then spread my potatoes over it, until they are not more than two or three inches thick: I then cover them with the rich surface soil, just so deep as I think necessary to prevent their being injured by light frosts. In this situation I let them remain until the season for planting.

Early in the spring I select what I suppose will be a suitable piece of ground. In making this selection, I chose a piece which lies fair to the sun, is tolerably rich, and considerably sandy. I break it up deep, and then let it remain until I wish to plant, which is some time between the middle of May and the first of June. I then plough again, and harrow well, so as to make it as mellow as possible. I then take a one-horse bar-share plough, and ridge up my ground by throwing three furrows together. This done, I cross it with a single furrow at the distance of about three feet. A very slight operation with the hoe afterwards prepares my hills, for I do not want them very large, nor high. I now go to my bed, and find my potatoes are all nicely sprouted, and those nearest the surface are up, and some of them have two and three leaves; but none, or but few, have yet any roots. I carefully remove the earth so as not to break the sprouts from my potatoes—for if they are broken off, they are destroyed. I put two or three potatoes in a hill, according as they are large or small, being careful always to leave the tops of the sprouts out of the ground, or near the surface, as they may be more or less advanced—so that when I am done planting, my potatoes are up, or nearly so.

You are now ready to inquire of me what I have gained by this process? I answer, several things. First, my hills are now light and mellow and ready to receive and nourish the young roots when they start—not baked, or rendered compact by the heavy spring rains. Secondly, I have completely subdued the grass and weeds, for they all had started to grow between the time of breaking my ground and the time of making the hills. I have then avoided all the trouble and labor of scraping down the hills two or three times before the potatoes are up, or while they are so small as not to admit of being hilled with the hoe. Thirdly, the earth and the season have now become warm, and my potatoes grow up rapidly. I work my potatoes in the following way. When the vines have elongated half way down the hills, I pass twice between the hill, each way with a bull-tongue plough; this mellows the ground. I then with a hoe, cover, say one third of the vine, leaving the remainder out, but yet so as not to make the hill very large.—This is all the work they require; for before the grass and weeds have time to start, the vines have so covered the ground as to smother them. Two years ago I did not plant my potatoes until the 7th day of June. The season was unfavorable; yet I made a fine crop, and the largest potatoes of the kind I have ever seen in Tennessee.

A SMALL FARMER.

Hopewell, Feb. 10, 1836.

ON STALL FEEDING.

Extract from a *Summary of Practical Farming*, a new English work, by C. Hildyard, Esq.

Stall Feeding, which has now become so much more common throughout the country than formerly, has had the effect of making meat, in most years, as cheap in the spring as in the autumn, which it used not to be; consequently, stall-feeding, of late, has seldom turned out to be profitable, but often, as I have experienced, a serious loss. Meat cannot be laid on lean beasts in the stalls, to repay the expense of the food they consume; the only chance of making stall-feeding answer, is, to put in the beasts which prove to be only three parts fat at the latter end of autumn, when grass will no longer improve them, but which will, in the stalls, increase in their weight, and improve in the quality of their meat; still, however, if the price of beef when these beasts become fat should be the same as when they were put into the stalls, the expenses will not be repaid. Meat must be a penny a pound more in the spring than it had been in the autumn, to repay the great expenses of stall feeding. It is carried on to a very large extent in Norfolk and Suffolk, and although from the great expense of oil-cake consumed, the farmers certainly must lose by every beast they feed, still they must continue the system on their large arable farms, for the purpose of turning their straw into good manure.

On beasts being tied up, white turnips will do for the first week or so; they keep beasts cool inside, but there is so very great a proportion of water in them that they are not of half so feeding a nature as Swedes. Those who have mangel wurzel should keep it as a *corps de reserve* for spring, or severe frost, when the turnips are frozen, which are often given to beasts almost as hard and as cold as stone, and which, in such a state, cannot be good for them. The turnips should be cut—there are many machines for cutting or slicing. The machine I use, and like better than any I have seen, I have had five and twenty years; it was made at Banbury, turns very easily with a large fly wheel, and cuts the turnips very expeditiously into irregular pieces, which I prefer to slicing them. My method of feeding, when the beasts have been up a little time, and when on what I call full feeding, is thus:—first feed in the morning, half a bushel of cut turnips, and afterwards half a bushel of cut hay, with about a quart of meal in it. These feeds repeated at noon; in the afternoon a feed of turnips, and supped up at night with hay in the rack, and three oil-cakes in the manger. Should oil-cake be cheap, give more of it, and less of meal. The difference of the weekly cost of my way of feeding is as hereinafter stated.

Oil-cake at £12 per thousand in London, with the cost of about $2 per thousand getting home, will bring the cost of each cake to very nearly three pence halfpenny. At £10 10s. to three pence.

The different weekly cost of feeding for each beast will be as under:

	s.	d.
10½ bushels of turnips, - -	3	6
1¾ cwt. of hay - - - -	5	10
	9	4

	s.	d.
Turnips - - - - -	3	6
1½ cwt. of cut and uncut hay -	5	0
Half a bushel of meal - -	2	0
	10	6

	s.	d.
Half a bushel of linseed - -	3	6
Three gallons of meal - -	1	6
1¼ cwt. of cut and uncut hay -	4	2
Turnips - - - - -	3	6
	12	8

	s.	d.
21 oil-cakes, at 3½d. - - - -	6	0
Three gallons of meal - - - -	1	6
Cut and uncut hay - - -	4	0
Turnips - - - - - -	3	6
	15	0

No food can be given to stall-feeding beasts that will fatten them so soon or so well as linseed oil-cake. It certainly is expensive feed, but not so expensive as it appears to be, taking into consideration that it fattens quicker. The expense of it, compared with other stall-feeding food, is thus: when it costs the consumer at home £12 10s. per thousand, each cake said to be 3lbs., (but never are quite so much,) the stone of 14lbs. costs 1s. 3½d. Linseed at 56s. per quarter, 1s. 11d. Barley meal, when the price of good grinding barley is 26s. per quarter, the stone will be about 11d. The stone of bean meal, when beans are 32s. per quarter, the same. Some winters I have fed with linseed instead of cake, and found it answer very well, although it added to the trouble of feeding. My mode of preparing it has been to break it in a little hand-mill, and steep it in cold water, in seven tubs, of a size sufficient for one day's feed; in this way it will have been steeped seven days before it is mixed with cut hay and barley, or (that which is better,) bean meal. If steeped in hot water, two days will do; if steeped longer than three, it is apt to get a little sour, which I think not quite so well for the beasts. There are annually great importations of linseed from which I conclude that it can be imported at a less price than it can be produced here. It is grown pretty extensively in some parts of the kingdom; it is, however, to be regretted, that the cultivation of it cannot be more general, and prevent the necessity of such great importations; and thus circulate amongst the English farmers a large sum of money which now finds its way into the pockets of foreign farmers. I have not yet made such use of wheat in feeding as to enable me from experience to speak decidedly about it. I have hitherto used only my tailing wheat, ground with barley, and thought it answered very well; but I hear of numbers of beasts being now fed entirely with wheat; and, it is said, quite as well fed, and at a much less expense than with oil-cake at its present price. The way of preparing it for feeding is thus:—steeped thirty-six hours; then laid for five days on a brick floor, turning it over once a day; then laid on a boarded floor, about six inches thick; in two days it will be fit for use. One gallon and three quarters in the grown state, per day, for each beast, is said to be about equal to one bushel per week of of dry wheat. Having lately seen one ox that was said to have been entirely fed on wheat, leaves no doubt in my mind that it must be a very nutritious food for beasts; I cannot however, restrain some feelings of regret that this grain, intended only for the use of man, should be thus appropriated. Most likely, after two more harvests, the price of beans and barley will correspond, as it used to do, with the price of wheat, and then it will no longer be given as food for beasts. After all the great trouble and expense of stall feeding, this mortifying circumstance has frequently occurred; the beasts are sold in the London market at a ruinous price to the stall-feeder, at less than they would have made in any other market; the butchers knowing that the beasts, having been so much knocked about in Smithfield, could not be turned out of an overstocked market to come into the next, have frequently bought them at their own prices. It will not be thus when the Islington market is quite established.

I have given rather lengthened details of stall-feeding, from its having been for some years my hobby; but I confess rather an expensive one. No fox-hunter, however, can look with greater pleasure on his stable of fine hunters than I have at my stalls of fine beasts. I have tied up, several years, in the course of the winter, one hundred and fifty beasts; at this time (December, 1835,) I have only forty, chiefly well-bred Durhams, grazed in this county, and I never had beasts that improved faster. I have some fine Herefords, bought good meat at Hereford October Fair, but from the drift home (as is always the case,) they made little progress in feeding in the first three weeks of their being tied up. If beasts that are put up in warm places to stall feed have a great deal of long hair on their chines, top of their shoulders, and necks, it is a good plan to cut it off, for when the beasts are thriving, they perspire much in their fore quarters, the long hair consequently gets matted together, and makes them very itchy and uncomfortable. Brushing also tends to their comfort and expeditious feeding.

Many beasts are subject to be blown after eating their green food: in such case let them be kept moving in a yard till the swelling goes down. If cutting to let the wind out be necessary, it should be done with a penknife on the left side, between the haunch-bone and the first rib.

It is not very probable that either grazing or stall-feeding will ever again prove a profitable concern. Great quantities of fat beasts and pigs will be imported from Ireland, even should the condition of the Irish poor improve so decidedly that the consumption of meat be increased two-fold; for Ireland would still be capable of producing a sufficient quantity for export to depreciate the price of stock in this country. Those will have the best chance of making a profit of grazing who can get beasts forward in winter, and who have rich grazing land to make them early ready for market, there being generally a fair demand for good beef in the months of July, August, and September. Times will not admit of giving exorbitant prices for fancy breeds; still, however, I have found that it well answers to give something more for beasts which evidently show some good breeding, as such will fatten much sooner than mongrels, and, therefore, at less expense; and, although there is not now the same difference as there used to be in the price of meat of various qualities, yet the finest is most readily sold at the top price of the market. There cannot be a question but that in the large breeds of cattle, the competition is between two breeds only—the Hereford and the Durham. I retain the same opinion as to the merits of these two excellent breeds, as I expressed more than twenty years ago. For grazing, I prefer Herefords—for stall-feeding, Durhams; having found that the latter increase faster in weight, and that if highly fed, they become more even carcasses of beef, and are less likely than many of the Herefords to prove patchy. It must, however, be admitted, that from their large frame they consume more food than Herefords. My idea of a good beast is, that it should have a straight and flat back, projecting hips, deep fore quarters, wide chine, sloping shoulders, good head, with prominent eyes, deep and bowed ribs, projecting bosom, good purse and flank, and not thin thighs.

From Thompson's Records.

NATIVE COUNTRY OF MAIZE.

Roulin, Humboldt, and Bonpland, have noticed this plant in its native state, in America, and have hence concluded that it was originally derived from that country. Michaud, Daru, Gregory, and Bonafous, state, that it was known in Asia Minor before the discovery of America. Crawford, in his History of the Indian Archipelago, tells us that maize was cultivated by the inhabitants of these islands, under the name of *djagoung*, before the discovery of America. In the Natural History of China, composed by Li-Chi Tchin, towards the middle of the sixteenth century, an exact figure is given of maize, under the title of *lachou-cha;* and Rifaud, in his "Voyage en Egypte, &c., from 1805 to 1807," discovered this grain in a subterraneous excavation in a state of remarkably good preservation. M. Virey, however, refutes these statements, (*Journal de Pharmacie*, xx. 571) by showing that these authors have mistaken the *holcus sorghum* for maize, and that the maize of Rifaud is the *holcus bicolor*, a native of Egypt according to Delile. Where maize occurs in the east, there is no proof of its having been carried there previously to the discovery of America.

Maize, (Zea mays) therefore sprung from America; *millet*, or *couz couz*, from Africa; rice, (*oryza sativa*,) from Asia; and wheat, barley, and oats, from Europe.

From Jameson's Journal.

PROGRESSIVE INCREASE OF TEMPERATURE AS WE DESCEND IN THE CRUST OF THE EARTH.

For the purpose of ascertaining whether a constant stream of water could be obtained by means of an Artesian well, sunk on the south side of the Jura mountains, at the distance of about a league from Geneva, and at an elevation of 297 feet above the level of the lake, M. Giroud, at his country residence at Pregny, bored to the depth of 547 feet without success. Despairing of success, he offered great facilities to any persons who might wish to prosecute the enterprise, for the purpose of scientific inquiry.

On this occasion MM. Aug. de la Rive, and F. Marcet made a successful application to the friends of science, and also to the government, and funds were obtained sufficient to enable them to continue the operations during eight months, and to extend the boring to the depth of 682 feet. The hole bored was about four and a half inches in diameter. Water began to appear in it at the depth of twenty feet; and it is worthy of remark, that the height at which the water stood in the opening, as measured from the surface, was lower when the greatest depth was obtained, than it was at half the depth. At 275 feet of depth, the water stood at 14 feet from the surface; at 500 feet it sunk to 22 feet; at 550 feet, to 35 feet. It then rose. At 595 feet, it stood at 24 feet 6 inches, but at 675 feet, it again sunk to 35 feet 8 inches. The result of this praiseworthy effort must operate as a salutary preventive from any farther expensive attempts to obtain running fountains, from the theory of an internal communication with the springs on the summits of the Jura.

Having attained the extraordinary depth above mentioned, the experimenter devised the means of ascertaining the temperature of this opening at different depths. As the common thermometer would not answer the purpose, they contrived a self-registering thermometer, constructed on a large scale, and whose accuracy was subject to the most satisfactory tests.

The following table exhibits the temperature of the bore-hole at the depths specified.

Depths below the surface in feet.	Corresponding temperature.
30	8.4 Reau.
60	8.5
100	8.8
150	9.2
200	9.5
250	10.0
300	10.5
350	10.9
400	11.37
450	11.73
500	12.20
550	12.63
600	13.05
650	13.50
680	13.80

It thus appears that the increase of temperature below the depth of 100 feet from the surface, as far down as 680 feet, is precisely 0°.875 of Reaumur (=1°.968 or 2° Fahrenheit, very nearly,) for every 100 feet. It will be observed, that the increase, instead of moving *per saltum*, as in some other cases, moves with remarkable uniformity. This, the experimenters think, may be owing to the care which was taken in this case to remove and avoid every source of error.

This experiment appears to be the first attempt to ascertain, with any accuracy, the temperature of the earth at considerable depths, among the mountains of Switzerland. The geological structure of beds which were bored through on this occasion, was as follows:—Next to the upper layer of vegetable earth, sand and gravel, was a gravelly and bluish clay, mingled with soft sandstone (*molasse*.) Below 120 feet commenced a succession of beds of marl and soft sandstone, of various thicknesses, which continued without interruption to the termination of the boring, 682 feet. At 220 feet there was a bed of coarse sandstone (*molasse grossiere*) two feet thick, with rolled pebbles, a remarkable fact, considering the depth. A strong fetid sulphurous odour was also observed in the layer of yellow marl mixed with sandstone, at the depth of 280 feet, that is near the level of the lake, and a grain of salt was found in the sandstone at this depth. The sulphurous odor again appeared at 600 feet, without the presence of any sulphurous compound that would account for its origin.

ON RAISING HAY.

To the Editor of the Farmers' Register.

You will oblige me by inquiring through the medium of the Register, whether hay has ever been introduced into a rotation on any large farm south of Mason and Dixon's line. I refer, exclusively, to upland hay, especially Timothy, and should be exceedingly gratified to ascertain if it has been raised for market in the section of country above mentioned, and the circumstances connected with the raising and marketing.

TIMOTHEUS.

LIMING IN FAIRFAX. EARLY HOUSING OF CORN.

To the Editor of the Farmers' Register.

Fairfax county, April 12th.

As cold and obstinate as the spring is, our wheat and rye looks better than usual, and gives promise of good return for our labors. Our preparation for the corn crop is backward. Tired of the tedious process of improving land by plaster and clover, I have purchased oyster shells, at a neighboring town, hauled them seven and a half miles, burnt them, and strewed 50 or 60 bushels to the acre over 65 acres of corn land, and shall apply burnt shells to the checks of 35 acres more. If this last experiment succeeds, I shall thus apply the shells I can obtain another year, as it is next to impossible to lime in the broad cast for less than $10 or $12 per acre. I have already devoted 36 years to the improvement of my farm, without much regard to expense, or the result, provided I believed my march was onward. Strange as it may appear, though some of my fields will produce full ten times the quantity they did 36 years ago, (and the fact can be proven in any competent court,) I could not now obtain for it as much as it could have been sold for 36 years ago. So much for "progressive society."

Man was instructed by the great Master of Christianity through his apostles to "see that nothing was lost." In full respect to this command, I have been making fences for two winters out of the brush of the pine I have cut for burning shells, and for fuel; and I now have miles of it, a good and secure fence upon the verge of a good ditch. Under the influence of the same command, in preparing to house my corn last October, I had to take down a house which was built of logs sawed out of willow oak, which was built full fifty years ago. The lockings, or intersections at the angles, were rotten: they were cut off, and a new house built of the logs, and I have no fear of its not lasting 50 years more. Yet this very willow oak is hardly worth cuttiag and mauling for farming use. My corn houses are built with a view of housing my corn in October, and I may add, much is housed in September. They are three in number, built of logs, resting from 6 to 9 inches apart, and lathed inside or out. At or about the Equinox, I begin to gather, husk and loft—taking care to move from house to house, day after day, until I am done. The "lofted" corn never injures. The green and rotten must be watched: but as I feed 12 or 14 horses, 50 hogs, and some beeves, no very great store of that is ever on hand.

X. Y. Z.

[It may be presumed that the houses of X. Y. Z. are unusually narrow, to render safe the keeping of corn put up so early. The last crop of corn (of the soft kind commonly made in lower Virginia) was so imperfectly dried at the usual time for gathering, that many persons, and even those who were aware of the threatened danger, (and took what were thought sufficient care to guard against it,) suffered more or less of loss. No other crop of corn has been so late in getting dry enough to shell, and to remain in bulk for sale, since that made in 1816. The safety of the crop of our correspondent, under such adverse circumstances, causes this part of his communication to be more important than perhaps he was aware of—and we shall be pleased if he will add a more partieular statement of the size of his cribs, the kind of corn cultivated, and also, if remembered, how early he began to put up the crop, last autumn, and what was its state, as to dryness, this spring.]

HEALTHINESS PRODUCED BY MARLING. ITS INTRODUCTION INTO DOMBE, AND OTHER UNHEALTHY COUNTRIES, RECOMMENDED.

Translated for the Farmers' Register, from the *Essai sur la Marne*, of M. Puvis.

The results of marling may be considered in a point of view more elevated, and still more important, than that of the fertility which it gives to the soil: they may perhaps have much influence on the healthiness of a country where it becomes a general practice.

Although it may not have been yet uttered by others, this opinion appears founded on strong probabilities, on strong analogies and precise facts, all of which appear to give it a sufficient certainty.

It is known that the calcareous principle is one of the most powerful agents to resist putrefaction. It is employed to make healthy, places inhabited by men and animals, in which sickness or contagion is feared; it serves to neutralize the emanations of dead bodies undergoing putrefaction; it destroys the deleterious effects which escape from privies, and which sometimes cause the death of those who are employed to cleanse them.

It even seems that calcareous countries are only unhealthy when they are interspersed by marshes, or when some causes, foreign to the soil and climate, determine the unhealthiness, as in countries on the borders of the sea, where the flowing of the tide, and the mingling of salt and fresh waters, infect the air by the deleterious emanations of their combination. This cause of unhealthiness is regarded as a certain fact; for salubrity is generally seen to appear whenever this mixture of waters is prevented.

In the valleys of rivers bordered by calcareous mountains, which enclose unhealthy countries in their interior, insalubrity commences there only as the calcareous soil, which is attached to the mountain, gives place to silicious soil. In the same plain, and far from a mountain, salubrity is seen to diminish in the same proportion that the calcareous soil of the surface does; and the *communes* of Bresse, which have an abundance of marly or calcareous soils, are much more remarkable for their salubrity than those on the white lands (*terrain blanc*[*]). While the ponds of Dombe, which are on the silicious soil, appear to be one of the greatest causes of unhealthiness, those of Bresse, which are on calcareous lands, do not show such effects in the country where they are found: so, likewise, the ponds of the country situated between the Veyle and the Reyssouze, to the north-west of Bourg, which are generally on calcareous soil, do not appear to injure the healthiness of the country in any manner.

For the support of this system, we will also cite the ponds of Berri on calcareous soil, whose emanations have nothing unhealthy; the laying dry of the ponds of Parracay, in the canton of Lignières, has added nothing to the healthiness of a calcareous country naturally healthy. And in the same canton, the pond of Villiers, which is said to be seven leagues in circumference, does not cause diseases on its borders. Besides, during the month of August, the water of the ponds on calcareous soil does not become blackish, as often happens in silicious ponds. The water would then be made wholesome by the calcareous principle, in the same way as their emanations.

In fine, Dombe, and Sologne, and a number of other countries are unhealthy, and subject to intermittent fevers without being marshy; but their soil is likewise silicious, and the land moist. Puisaye, and a part of Bresse, in similar land, which contain little or no calcareous soil, have also many autumnal fevers.

Without pretending to explain, entirely, facts so remarkable, we will, however, observe, that the calcareous element, possessing a great force for combining with the principles which are encountered in the soil, may very well hinder the formation, or hasten the decomposition, in the bosom of the earth, of these substances so little known, which, having become volatile and breathed by man, or acting in every other manner on his organs, dispose him to receive disease.

These deleterious substances, which infect the air of unhealthy countries, can take their rise only from the ground; for the soil alone distinguishes an unhealthy country from the neighboring regions which are healthy. All other circumstances of the atmosphere, temperature, its variations, and climate, are common to both; the unhealthy country is constantly exchanging its vitiated air for the pure air of its neighbors. It follows then, of course, that the unhealthy exhalations of the soil should be constantly renewing the injurious principle which beneficial winds tend to carry elsewhere.

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[*] The reader of M. Puvis' essays on lime and marl, which were inserted in Vol. III., will remember, that this provincial term, and others (*plateaux argilo-silicieux*, &c.) are used to designate a peculiar kind of soil, destitute of calcareous matter, stiff, intractable, and poor—and which seems precisely of the character of the poor ridge lands of lower Virginia, to which calcareous manures are so peculiarly adapted. Ed.

We will add to the foregoing remarks, that this calcareous principle, possessing a great force of absorption on the constituent parts of the atmosphere, may seize on the deleterious principles themselves, which will have escaped its interior action, and decompose them for the profit of vegetation; that this principle, as we have heretofore seen, by making vegetation more active, increases the force of absorption of the plants, and favors the advancement of leguminous plants which live principally at the expense of the atmosphere; that this vigorous vegetation tends, as it is known, to make the air healthy; either by emissions of oxygen, or by the absorption of carbonic acid, or by some other means, which nature has kept a secret.

We will remark again, that the waters which spring from calcareous mountains, and which are more or less charged with the calcareous principle, conveyed over marshy meadows, invigorate them, and make leguminous plants and grasses grow there. Calcareous waters, then, make the soil healthy, and the soil made healthy in its productions, will be likewise so in its emanations.

Besides, the soil too moist under cultivation, as we have seen before, is found invigorated by marl; its products become those of healthy soils: waters that remain there, are then also modified, as well as the soil. In moistening the marled soil, these waters are charged, more or less, with the calcareous principle, which they transmit with the sap to vegetables: they are then, themselves, made healthy and capable of giving health, since they become favorable to vegetation, instead of being unfavorable, as before marling.

M. Garnier, engineer of mines, in his excellent work upon the borer and its use, admits, in accordance with the observations of Linnæus, as a principle of experience in the art of the well-borer, that waters, which run over beds of clay, are often unhealthy or impure, while those which spring from calcareous beds are light, clear, and very healthy. A number of reasons, of greater force, bring us to the conclusion, that waters are made healthy by the calcareous principle.

In fine, (especially in Dombe,) in driving away the growth of silicious land to replace it with leguminous plants, the calcareous principle would destroy this plant with the cadaverous odor—this atal *flouve* which covers and exhausts all the surface of the fields after harvest—which infects the air with its pestiferous exhalations, and which we must regard as one of the principal causes of the sickliness of the country.

It would be an insufficient opposition to say, that a small addition of calcareous principle to the soil could not affect the general unhealthiness of the country: on the contrary, it seems that this ought to be the most active means that could be employed; for, we have seen before, that the deleterious exhalations, which are mixed in the air that we breathe, and which infect it under the gaseous form, proceed from the soil; and we ought to think that it is from the upper or cultivated layer, because the lower, which the water could not penetrate, could no more give passage to the gaseous emanations.

Besides, we cannot imagine an action more direct, more close, and more intimate, than that of marl on ploughed land. One conceives that it can attack the unhealthy principle in the soil, as well, and in the same manner, as lime water, or slaked lime, destroys them, in habitations, on dead bodies, and in privies. These great effects are produced by a single and superficial application, while the addition of marl is made, and acts on every part of the ploughed bed; and it is in their own laboratory, before they can be formed, and even in their elements, that the principles of insalubrity are attacked.

In short, the calcareous principle which changes the nature and productions of all the vegetable mould, ought necessarily to change the combinations, and modify the elements of them. The emanations of the soil, which are the result of these combinations, ought then to change also; and these emanations ought to cease being unhealthy, because the general and known effect of the calcareous principle is to give health.

The opinion, that considers the calcareous principle, and consequently marl, as one of the great causes of health, although it may not have yet received its sanction from the experience or discussion of enlightened men, is, then, not only supported by conjectures, which explain and render it probable, but is also founded on facts, which give it, to all appearance, a great degree of certainty.

It would be then under the double report of salubrity and fertility, that we can consider the introduction of marl into Dombe, or in analogous countries; this double end ought to sustain our efforts, and we would reap, from our labor, a sufficient recompense, if we could aid in inducing the introduction of marl into this important and unfortunate portion of our conntry.

No one doubts, at the first glance, that marl is suitable to almost all the extent of the unhealthy country: its soil is almost all entirely moist and argilo-silicious in composition, on which marl displays the greatest activity.

This country forms a triangular flat, placed between the Saône, the Ain, the Rhône; its two largest sides follow the direction of the Saône, the Ain and the Rhône, and its base rests on what is properly called Bresse. Its situation, near a great outlet, and on two navigable rivers, seemed to have destined it for great prosperity; but its inferior soil, and its unhealthy climate, cause very little profit to be made from its happy position.

This country could possess all the advantages of its position, and become healthy and fruitful. For this purpose, we would think it would suffice to give to the soil the calcareous principle which it wants. This amelioration is possible, through the means of marl, for a sufficiently great extent of this country. We have seen, formerly, that when marl is found in some parts of a basin, there is some certainty of its being found in other parts.

As marl is abundant in the particular valleys of the Saône, the Ain, and the Rhone, and part of this country lies in the basins of these three rivers, it ought also to be found there. Guided by these ideas of analogy, I have myself found it between Chalamont and Meximieux, and in the environs of Chalamont. M. Rivoire has sent me some from Rigneux, which contains 60 per cent. of carbonate of lime. It is found in the little valley of a rivulet which passes St. Eloi: that which passes Chalamont contains it also in great abundance; and it remains proved to me, that the valleys of the small tributaries of the three large rivers contain it in Dombe, as in Bresse; that, if there is no marl yet discovered on the table land, it is because on flats, much elevated above the course of the three rivers, it would be perhaps found at a very great depth, which would render its extraction difficult enough, on account of the water. which could run in the work. However, there are no certainties on this point; and the country ought to be explored on the table lands, in this point of view, where, perhaps, would be found, as in Bresse, marly veins showing at the surface of the declivities. The borer would be very usefulfor this purpose, taking care to direct it where sand would be found.

If it happens, which is very likely, that no marl can be found in the interior on the table lands, the bottom of the valleys of the three great rivers which surround this country, and the first range of hills which border the bottom of the basins, contain it in large quantities, and can furnish continual supplies for the interior. Besides, the country is furrowed by small rivers, in whose channels or basins much of it can be seen. With these resources alone, a considerable part of the surface could be ameliorated; and if bad roads, moist climate, and the craggy soil, prevented the transportation of marl in the interior, lime, which is the vivifying principle of marl, could supply its place. We propose to estimate, hereafter, this resource, which has changed the face of so many districts of analogous soil in France and other countries.

We ought not to conclude on this subject, without observing that marl, to diminish sensibly unhealthiness in the whole of a country, ought probably to be extended to a great part of its surface. The marl of each farm would cause a diminution of unhealthiness, according to what we think, for that property itself and its inhabitants: but they would still suffer from the unhealthy emanations of the neighboring places, which had not been marled. Salubrity would increase in proportion as the general marling would increase; and when the whole surface would experience the benefits of marl, then, with the healthiness which would preserve individuals for labor and increase of the population, with the fecundity which would offer the greatest products without being obliged to increase the labor, we would see the country advance rapidly towards a better future. Then, by the force of things, and at the same time that the marling would develope its results, we would come to the draining of the greater part of these numerous ponds, which would be the only remaining source of unhealthiness. The ponds which, for ages, receive, by means of the waters, the manure of the surrounding land, would soon be made, some, good meadows, and others, the best cultivated lands of the country; and these lands, provided with accumulated vegetable matter, by receiving marl, would be made healthy and fruitful. This country has very few marshes. Almost all of the ponds are drained, first to obtain the fish, and then to be cultivated; and, consequently, they contain no water. The marshy meadows themselves, which are at the extremity of the ponds, would be drained and be made healthy by the draining of the former.

Besides, the table-land, which forms this country, is very much elevatedabove the valleys, of the two rivers which border it, and receive its waters; for the numerous ponds, which succeed each other, are the places where the waters meet, and consequently the lowest parts of each canton. But these low places have themselves a very great fall, as it is equal to the height of their banks, which are, on an average, ten feet high. The central part of the country, which separates, (in going from north to south,) the two flowings of the waters, the one towards the west in the Saône, the other towards the east in the Ain and in the Rhône, is then elevated above the countries which border these two rivers, in a measure at least equal to the sum of the banks of the ponds, which would be more than one hundred feet; for the number of these ponds is large. The country has there a considerable declivity, and, consequently, after the draining of the ponds, the rain water would easily run off, without forming marshes.

This country, freed from the greater part of its ponds, having a large portion of the soil made healthy, and purged from the infected *flouve* which covers it, cultivated by a population more numerous, stronger, and richer, would advance rapidly to prosperity, sustained by the market, which a city of 150,000 souls offers, it would bring, on its own soil, (which would have ceased to be deadly,) a part of the inhabitants of this city, which would also be enriched by the new addition of commerce. These inhabitants would come with eagerness to repose in the bosom of agriculture, in a country become healthy and fruitful, escaping from the embarrassments and cares of the earlier part of their lives; bringing with them their large capitals, they would draw thither hands for labor; they would give movement and life to all around them; they would develope industry in a country now abandoned, by a greater part of its proprietors, to the care of a scant and weak population, without any degree of energy.

From the Southern Agriculturist.

SALT MARSH GRASS AS FODDER.

James Island, April 6th, 1836.

I have frequently wondered that our planters do not give more attention, to curing salt marsh [grass] as a fodder for their horses and cattle. This is the more to be wondered at, when we reflect that hay is now selling at $2 per hundred. When will we begin to supply ourselves with our own provisions? When will we become independent of the northern markets? Is it because we have not the means at hand? I shall show you, Sir, that in one article at least, we have the means of supplying ourselves; and that too, not only well, but cheaply. I mean in the article of salt marsh [grass] as a substitute for hay.

For six or seven years back, I have been in the habit of curing salt marsh [grass] as fodder for my horses and cattle. I find that they prefer it when properly cured, to any other fodder which you can give them. It must, however, be *properly* cured, or, like all other fodder, your creatures will refuse it. This (April) and the two coming months, (May and June,) is the time for cutting the marsh. It is then most tender, possesses most juice, and will dry best. During these months, I keep a boy or two continually cutting. One boy will cut one or two boat loads per day; as the tide suits. As soon as cut, I have it well washed in the salt water; spread it out a day to dry in the sun; and immediately after, pile it up in stacks to keep. No apprehension need be entertained of its heating or moulding; as the salt in the marsh prevents every thing of the kind.

Marsh [grass] thus cured, will keep during the whole year; and in the winter will afford a fodder that horses and cattle will prefer to all others. Its advantages are many. Cattle that feed upon it, will seldom, if ever, be troubled with worms or cholic; since the salt in the marsh totally destroys the worms, and prevents the cholic. When given green to your horses in the spring, it will at first act upon them as a gentle purgative, but after feeding with it for a day or two, this effect will entirely wear away, and it will then prove one of the most rapid fatteners.

Few planters plant corn enough to afford them fodder for the cattle throughout the entire year. Let those who reside in the vicinity of marsh, cure this article as I have directed; and if they will take the word of one who has tried it, they will never want fodder, nor have to eat poor cattle.

TRY IT.

From the Genesee Farmer.

GOOSEBERRIES.

Unless we much misunderstand the signs of the times, the current of public opinion is at the present moment setting strongly against the imported, or, as they are more generally termed, English varieties of gooseberries. There can be two reasons assigned for this state of feeling, one of which is the great uncertainty which attends their fruit reaching perfection; and the other is the fact that in richness of flavor they are inferior to some varieties of our native ones. These objections in the main appear to be well founded, and as such, are certainly deserving the attention of those who wish to engage in the cultivation of this excellent fruit. That the English gooseberry sometimes arrives at maturity unaffected by the mildew, is certain; but the chance is very small that it will do so, and it is extremely tantalizing to the grower to see the plague spots spreading over his fruit, and at once placing them beyond the reach of hope. The attack of this disease, for such the mildew is, is the more disagreeable, from the fact that gardeners have as yet discovered no remedy in any measure adequate to the evil. While the native varieties remain untouched, the foreign kinds, standing near, are entirely destroyed. We had a few bushes last year, the fruit of which, with a few exceptions, was free from mildew, while a friend who had a fine row of them, and whose bushes were early in the season loaded with the fruit, did not gather one that was fit to eat.

While all admit they are much larger and fairer, and when free from mildew a most splendid fruit, still to our palate the foreign varieties lack that condensed richness and fragrance which belong to some of ours; and beauty, though a good thing in itself, can hardly be considered a fair set, off for flavor when the palate is to be the judge of merit. On the table we are sensible a plate of our half prickly wildwood fruit can hardly compare with the round plump glossy skins of the English kinds; yet there are few, who, so far as taste is concerned, would not resolutely prefer those grown from our own native shrubbery. That these may be improved in size we have no doubt, and if it can be done without sacrificing flavor and richness, all would hail such improvement; but if this cannot be done, if each advance in size and beauty deteriorates them in quality, why then we say give us our old fashioned berries, smaller in size, but free from disease, and rich in all the qualities that constitute one of the most delicious fruits in the world.

G.

From the Genesee Farmer.

CURRANTS.

Among the great numbers of fruit-bearing shrubs and vines, there are few more worthy of notice, or which better repay the expense of cultivation, than the currant. It is an abundant bearer; of easy culture and rapid growth; and whether dried or fresh, is convertible to a great variety of uses in culinary operations. In this country we have three kinds; the red, which is the most common; the white or rather yellowish, since when ripe it has a slight yellow hue; and the black, which is chiefly cultivated and valued for its medicinal qualities. Of these varieties we much prefer the white; as the fruit is usually much larger than the red; it possesses more saccharine matter when ripe, and is consequently better adapted for the table; and from it a wine, by proper management, may be produced, superior to many of the imported wines. No man, however small may be the piece of land he owns and cultivates, should neglect the growth of the gooseberry, currant, &c. as they occupy little room, and contribute much to the comfort of a family, besides preventing so far the thankless business of begging fruit, or saving many a six-pence in its purchase. Currants are grown, where the roots are not to be procured, or where new kinds are to be introduced, by cutting shoots of six or eight inches in length, making a shallow furrow in the earth, and placing them at proper distances in a slanting position with one or two buds above the surface. In this way they will hardly fail of growing well. The earlier in the spring the operation of setting the shoots is performed the better; although they will frequently do well until the buds are fully swelled. Gooseberries may also be propagated in the same manner, though their growth is not quite so certain; and neither they or currants, when set in this way, require any other care than that the shoots should be kept clean of grass and weeds for a year or two. In making selections for setting, none but the finest kinds for size and flavor should be chosen, as a bush the fruit of which is small and worthless will occupy as much room as one which unites all the good qualites desired.

G.

From the Genesee Farmer.

THE HESSIAN FLY.

One of our new subscribers in Ohio, has expressed a wish to see a dissertation on the Hessian fly; and as it may be acceptable to other of our readers, we shall attempt to furnish briefly, the most important of the information which we possess respecting it.

This insect belongs to the order *Diptera*, which includes all those insects having only two wings, and to the genus *Tipula*. The number of species belonging to this genus are numerous, amounting to more than one hundred and thirty of those hitherto known and described, and as many of these resemble each other, care is necessary, in observations on the Hessian fly, that no mistakes are made in identifying the species.

The following description of the Hessian fly, (*Tipula vaginalis tritici* of Mitchill,) is given by Dr. Akerly, in the American Magazine and Critical Review, of August, 1817. "It is a very small black insect, not so large as the moscheto of this place,* with two fine transparent wings, from the roots of which, three ribs diverge, as through the leaf of a plant. The body, when examined by a microscope, is found to be divided into four segments, with a few hairs observable on each. The legs are of a yellowish cast, and transparent; the head inflected, with a short proboscis."

This, in common with nearly all other insects, passes through four distinct stages of existence: 1, the *egg;* 2, the *larva*, or maggot; 3, the *pupa*, or dormant state; and 4, the *perfect winged insect*. In this part of the country, it passes through two generations in one season, and attacks the wheat both in the spring and in the autumn. The fly, or perfect insect, deposites its eggs in the autumn, soon after the young plants appear above ground, between the lowest part of the leaf and that part which forms the main stem or straw, and as near the root as possible. "It resembles, at first, a very small white nit, and as it grows larger become a sluggish and almost inanimate maggot, of a white color. In this state, the proper and most natural food is the sap or juice of that kind of green wheat which has the most delicate straw."† It remains in this situation through the whole winter, apparently in the chrysalis state, without suffering any injury from the frost or snow; and in the spring, as soon as the weather becomes warm enough, and generally about the time vegetation has fairly commenced, it is transformed into the fly. In this state it performs the functions necessary for a continuation of its species. It lays its eggs between the straw or stem and the sheath which encloses it, as before described, and dies; and a new generation succeeds.

These eggs are soon hatched by the warmth of the season; and the young insects may be discovered in the form of small white maggots, within the sheath of the straw, and just above the lower joints. They here continue to feed upon the sap and tender fibres of the plant, by which it either withers and dies, or is stunted in its growth, so that the grain does not arrive at maturity. They are changed into the pupa state before harvest, and at this season, while the wheat is yet green, their presence may be readily detected by walking through the field and pressing the heads with the fingers; those which feel soft, and unfilled with grains, are those which have been injured by the insect; and if the stalk be examined, they will be found near the lower joints, somewhat resembling a flax seed, but smaller and slenderer, and of a dark brown color. They continue in this state till after harvest, and may be found upon the stubble in the field. Early in autumn they pass into their winged state, and lay their eggs in the young plants of wheat as before described.

When the fly is about to issue from the pupa into the state of perfect insect, it disengages itself by boring a small round hole through the brown case in which it is enclosed, and through the sheath of wheat just opposite to the place where it lodged, and this hole may be easily discovered as long as the stubble remains entire.

With regard to the time of undergoing its final transformation the first time in the season, Judge Havens observes, "the size of the maggot when full grown, and the time necessary to complete its growth, depend in a great degree upon the quantity of nourishment it may obtain from the grain, and the number of maggots that may happen to be on one straw. This, according to the best of my observations, is somewhere between four and six weeks, which will bring the time, in which its growth will generally be completed, to the first part of June. But here the several causes of variation in the time of its being laid in the wheat, and of its completing its growth, both conspire to render this time so various, that some will be full grown, and others transformed into a chrysalis [pupa,] while others are small; and this circumstance has no doubt led many skilful observers to suppose, that there are two complete generations of the insect before harvest." The second time that the fly issues from the pupa, depends also in a great degree, on circumstances. "It generally," says Havens, "begins about the 20th or 25th of August, and continues in a greater or less degree through the whole month of September; but by far the greater part of the species are without doubt transformed into a fly, in the first part of this latter month."

By understanding the history of this insect, we are enabled to apply the means for its destruction, or for escaping its ravages. As it remains upon the stubble in the pupa state after harvest, the first means to be used, is, to destroy the stubble soon after cutting the wheat. This is to be done either by ploughing or by burning. If by the former, the pupa is buried in the earth, and is thus prevented from changing to the fly; or if it changes, it cannot escape. Unless therefore, the stubble be completely buried, the experiment will not succeed, consequently the deeper the ploughing the better. If by the latter, the stubble must be entirely burnt in order that the destruction may be complete, for, as the insect lies near the root, it will escape, unless the fire be well applied.

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* Its body is about one-ninth of an inch in length.

† Havens on the Hessian fly, in Agric. Trans. New York, vol. 1, p. 77.

But the best method of preventing the mischief occasioned by it, is to sow so late, that the wheat will not be above ground, until the autumn fly has perished. As the fly is in the state of greatest activity early in September, the wheat which is up at that season, will be most liable to be destroyed; on the contrary, if the sowing is deferred till a month later, it will in a great measure escape. It is supposed that a single frost will destroy all the insects while in the state of the fly, and if the wheat is not up before such an occurrence, no danger whatever is to be apprehended.

In endeavoring however, to escape one calamity it is necessary to avoid the opposite evil. If the grain is sown too late, there will be danger, as is obvious, of its suffering from the effects of the frost of winter, or in other words, of being *winter killed*. Hence a middle course must be adopted. It may also be observed, that as there is a decided advantage in early sowing, where wheat is not attacked by the fly, it would not be advisable where no danger of such attack is to be apprehended, as is the case in some places, to sow late in order to avoid its ravages.

The best evidence in favor of late sowing, as a means of preventing injury from the fly, is experience. Among other instances, two are related by a correspondent of this paper in Pennsylvania, (vol. 3, p. 321,) who waited till the first autumnal frost, when his grain was sowed and covered as speedily as possible. The result was, that next harvest he had a good crop of excellent wheat, while the neighbors on each side of him, who sowed earlier, did not reap more than one fifth of the quantity, and that injured by the fly. The other instance was this:—One half of the wheat crop was first sown, when a heavy fall of rain took place, which retarded the sowing of the rest until dry weather with frost; when it was harvested, the first sown was scarcely worth taking into the barn, while the latter proved an average crop of merchantable wheat. In these instances, the effect of frost in destroying the parent insect, is obvious.

Although the *autumn* fly is considered as the cause of the far greater part of the mischief, much injury is often committed by the *spring* fly. This is more especially the case where the wheat is sown too *late* in the fall, and is not of sufficient vigor the next season to out-grow the effects of the injury. This is an additional reason for selecting a medium period for sowing.

In conclusion, therefore, we would recommend, as the best general rule for escaping the ravages of the Hessian fly, to sow, if the season and circumstances will admit, immediately after the first frost, on ground which has since harvest been kept clear from all vegetable growth* which might serve as a refuge for it, and never in any case to sow before the early part of October. But as additional facts brought to light by further experiments, cannot fail to be useful, we shall close this article by repeating the suggestion of Judge Havens:—"Let those who may have leisure and curiosity on this subject, and who reside in different parts of the country where the insect may prevail, sow small patches of different kinds of wheat, as often as once or twice in a month, during the whole season, adjoining to some field of wheat or stubble, where the insect may be found in greatest number; and let its progress be observed on those different patches of wheat, and the result of the observations be collected and compared with each other."

From the Southern Agriculturist.

ON THE CONDUCT AND MANAGEMENT OF OVERSEERS, DRIVERS, AND SLAVES.

Santee, April 3, 1836.

Mr. Editor,—I received your letter a month since, requesting me to give you "my system in the management of Mr. —— plantation." Your letter I would have answered before this; but being now somewhat advanced in age, and not exactly in writing order, I deferred doing so until the present time. However, since you think an account of my system of management might benefit overseers generally, I shall comply, even at this late hour; for I do assure you, that nothing gives me greater pleasure, than to have it in my power to say or do any thing, however little, that will improve overseers in their regulation and management. Having been an overseer myself for twenty years, I think, I ought to know how important it is to them to be well informed as to their duties. But, Mr. Editor, this is not acting like a good overseer; I am not writing to the point in question; so without any more preface, I shall give you as the best outline of my system, an account of what you desire.

It was fifteen years ago, that I was first employed to overlook and superintend the plantation of Mr. ———. As a wise and conscientious man, Mr ——— required of me testimonials as to honesty and activity of character. When I satisfied him as to these, he then, in a very explicit manner, told me, what would be required of me. Among an hundred other things, he impressed upon my mind, that I was to be his representative; to regulate his slaves in their moral and general conduct; to sustain my employer's reputation among merchants for the quality of his productions; and to make his plantation a pattern of regularity and order to the neighborhood around. When Mr. ——— began to talk in this way, I at first thought he was quizzing me. I had before been an overseer, but had never been spoken to in this solemn sort of manner. With other planters, when I showed that I was honest and active, that was enough—I was directed where I was to live, and my authority as overseer commenced, for evil or for good, for one year from that date. I say that when Mr. ——— first began to lecture me as to what he would expect of me, I thought him quizzing; but I soon changed my mind. I soon discovered that he meant every word he said; and moreover meant, that it should be attentively listened to, and executed. He told me that there was no duty more difficult than the one I was about to assume; accordingly, said he, we had better understand one another explicitly. He then recounted every thing he would expect of me; how I should demean myself; how I should manage his slaves; nothing was omitted which he could think of.

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* It is not probable that this insect attacks any other than culmiferous plants; it is known to attack rye and barley, and possibly it may feed upon other plants of this natural order; if so, these would furnish a habitation for it through winter, unless they were destroyed.

Nor was Mr. ——— satisfied here. Most of my duties he had commmitted to writing, and I was required to keep them as a constant guide to me in the management of his plantation. Whether they were excellent or not, shall appear, when I speak of how I managed his estate; for let me assure you, Mr. Editor, that if I have been successful as an overseer, I attribute all, to the advice of my employer.

When I commenced my duties as overseer with Mr. ———, I was firmly impressed with the belief, that "knowledge is power." I felt that whether applied to the sciences, or to the pursuits in which I was embarked, that information of every kind was useful to me. Without being obtrusive, therefore, I determined to pick up from every planter and overseer, what I could learn as to my business. I found that the most ignorant man could teach me something which I had not known before. What I learned, I always submitted to my employer, when I could do so with convenience. Sometimes he would dissent from what I proposed; and then I was never ashamed to argue the point with him, and show him the reasons why I thought myself correct. I pursued the same plan with the driver. Whatever I was to do, I always consulted him about. This gave him confidence and responsibility in himself, and character in the eyes of those he had to superintend.

Speaking of the driver, brings me to notice my management of him more particularly. I always required of him, that he should dress myself better than the other negroes. This caused him to maintain a pride of character before them, which was highly beneficial. Indeed, I constantly endeavored to do nothing which would cause them to lose their respect for him. With this view, I made it a rule never to scold or lecture my driver before the other negroes for any inadvertence or fault. If he did any thing which was out of the way, I took him by himself and lectured him severely. If the fault was of a flagrant nature, as was once the case with him, I publicly flogged him before the other negroes, and disgraced him by appointing another in his place. I would never listen to every tale that the negroes might have against the driver; but whenever they could urge any thing which seemed plausible or correct, I would consent to have him tried. At these trials, I would preside as umpire—would listen to the evidence for and against, and my decision always awarded a punishment of some kind to the guilty party—to the driver, if guilty, or to the accusers if they did not make good their charges. Persons might suppose that the fear of not making out their case, would prevent the negroes from accusing when really they had been injured; but I never found a case of the kind.

Every night, it was my driver's business to enquire of me what I would have done the next day. Although, he frequently had his duties allotted to him for a week ahead, he was nevertheless required to do this regularly every evening. He was also at the same time required to report the work of the day ended. It will be asked what was the necessity of all this, when I superintended every thing that was done myself? I answer, it gave the driver a habit of regularity, and prepared him for a proper discharge of his duties, should I be sick. The more the driver is kept aloof from the negroes, the better. The truth is, he cannot maintain too much pride in his conduct towards them. Once let them believe that they are his equals, and all control is lost.

I have said so much about the driver, that I have little room to speak of the negroes. Their proper management constitutes the chief success of the planter. If he has not a proper control of them, he had much better give up planting; for as sure as he continues, they will ruin him.

Having laid down rules for the regulation of your plantation, the first consideration is the study of the character of your negroes. This will not take you long to do; in one month the full character of very slave you superintend might be learnt. For the breach of every rule, *certainty of punishment* is every thing. If a negro is permitted to go once unpunished for a fault, he will at any time afterwards do the same. and risk being flogged. I have always discovered that where the overseer is *positive*, that the negroes are better disciplined, more mildly treated, and consequently more happy; once, however, a negro has been punished, the fault should be overlooked, and his spirits should not be broken down by continually reminding him of his past misconduct. Not observing this rule, has very often ruined some of the very best negroes. I have frequently met with negroes, whom the whip would ruin, with whom a little flattery could do every thing. I will state an instance of the kind. Ten years ago, I bought, at auction in Charleston, a stubborn, ill looking fellow, sold as runaway. Upon examination, I found that he had the marks of having been repeatedly whipped. I asked the fellow the reason of this, he said it was because he could not do his work. I was convinced that Ben, (for that was his name) had not been properly managed. I accordingly purchased him, at a reduced price, took him home, and put him to work by the side of some of my best workers. I pointed out what I would require of him; and in a flattering way, observed to the other fellows, that I was now going to give them a push. "Now," said I, "Ben, I will expect you to do your best; keep close to those fellows, and if you follow them up close, you may feel proud of yourself." He seemed pleased at my remark, said he would, and commenced as if he intended to do his best. I left Ben to himself, and in a few hours after returned to where he was working: he was getting on exceedingly well, for which I complimented him. It was in this manner that I urged him on throughout his day's work. That evening he finished his task, did it well, and went home much pleased with himself. This was the first step towards the reformation of Ben. By following up my treatment, I so entirely reclaimed him in a few months, that from being a runaway and rogue, I made him one of my primest and trustiest negroes.

Order should be strictly maintained among negroes. By this, I mean order, in their occupations and duties. Once or twice in the month, I made it my business to visit each negro house; I examined every thing therein; saw that the negroes permitted no dirt or filth to be collected about them, and as invariably punished them where I found they had done so, as if they had omitted to do their day's work. This plan of supervising your negro houses, works wonderful effects upon your plantation. It keeps your negroes cleanly and healthy; and prevents the concealment of all kind of roguery. If every overseer would follow this plan, I am convinced that there would be little use for patrol laws.

I not only attended to the negroes in the cleanliness of their houses, but I also, enjoined the strictest observance as to the cleanliness of their dress. If negroes are left to themselves, they will, generally speaking, pay little attention to their dress. I have seen them on some plantations almost naked from suffering their clothes to remain unmended. This can easily be remedied. Make it a rule to oblige every negro, to have his clothes mended as soon as you discover them broken; and if your force be large, have some old person to serve as "general mender" to the plantation, and you will never have to insult the eye with a set of ragged negroes.

Next, to making your negroes attend to the orderly arrangement of their houses, and dress, you should oblige them to attend also to that of every thing about the plantation. I obliged every negro on the plantation to superintend every thing in its place that he finds displaced. If, for instance, a negro passes a fence that has been put down; if a rail has been thrown from its place, it is his business to replace it, or to inform the proper person whose business it is to do so. This rule I followed when I was a poor man, working at a salary of five hundred dollars a year; now that I can drive my chair, I stick to the rule still. I believe that a great portion of my success in life depended upon this simple rule, which was first taught me by my employer. I was riding out with him, a short time after coming to oversee for him; he happened to pass by a fence where one of the bars had been left down, by which means the cattle had got into the oats patch. His coachman had passed by the fence in that condition once before that morning. Mr. ———, upon his return home had his coachman punished. It was in vain that he said in extenuation of his conduct, that he had not observed the bar; it should have been observed by him, as well as by his master; so he was punished. Though I lived fifteen years for Mr. ———, I never knew his coachman to be punished for the same thing a second time. Some persons might have thought Mr. ——— severe for punishing a fault so apparently trifling; but as I have before observed, it is by the punishment of small faults that large ones are prevented.

Negroes should in no instance be permitted to *trade*, except with their masters. By permitting them to leave the plantation with the view of selling and buying, more is lost by the owner than he is generally aware of. Let each planter have upon his place, a store of such articles as his slaves usually purchase elsewhere. These can be dealt out to them for their corn and such things as they have to sell. By so doing, your negroes will be better and more cheaply provided; and be put out of the way of the temptation to roguery.*

I hold out every inducement to the negroes to marry among themselves on the plantation; thus giving them no cause for leaving their homes. Whenever my employer could do so, he always purchased the families of any negro he might own, assigning the reason I have already given.

But, Mr. Editor, I must conclude: I have already trespassed upon your patience too long. You will accept my crude reflections, as they are intended, for the benefit of overseers, who have, as I have had once, to commence. Should you desire to have from me, more particularity, be pleased to interrogate me, as to the points upon which you desire information; and I shall endeavor to answer your queries.

Not wishing to intrude my humble name upon the public, I subscribe myself with great respect,

AN OVERSEER.

From the Farmer and Gardener.

AMERICAN OIL WELL.

About ten years since, whilst boring for salt water near Burkesville, Ky, after penetrating through solid rock upwards of 200 feet, a fountain of pure oil was struck, which was thrown up in a continued stream more than 12 feet above the surface of the earth. Although in quantity somewhat abated, after the discharge of the first few minutes, during which it was supposed to emit 75 gallons in less than a minute, it still continued to flow for several days successively. The well being on the margin, and near the mouth of a small creek emptying into Cumberland river, the oil soon found its way thither, and for along time covered its surface. Some gentlemen below, curious to ascertain whether the oil would take fire, applied a torch: quick as a flash, was exhibited the astonishing spectacle of the surface of the river in a blaze, which soon climbed the most elevated cliffs, and scorched the summit of the loftiest trees, to the no small discomfiture of some of the neighbours. It ignites freely, and produces a flame as brilliant as gas. Its qualities were unknown, but a quantity was barrelled, most of which soon leaked out. It is so penetrating as to be difficult to confine in a wooden vessel, and has so much gas as frequently to burst bottles when filled and tightly corked. The color is green, but upon exposure to the air assumes a greenish hue. It is extremely volatile, has a strong pungent, and indescribable smell, and tastes much like the heart of pitch pine. For a short time after the discovery, a small quantity of the oil would flow whilst pumping the salt water, which led to the impression that it could always be drawn by pumping. But all subsequent attemps to obtain it, except by a spontaneous flow, have entirely failed. There have been two spontaneous flows within the last six years. The last commenced on the 4th day of July 1835, and continued about six weeks, during which time 20 bbls. of oil were obtained. The oil and the salt water with which it is invariably combined during these flows, are forced up into the pump, supposed by the gas, above 200 feet, and thence through the spout into a covered trough, where the water soon becomes disengaged and settles at the bottom, whilst the oil is readily skimmed from the surface. A rumbling noise resembling distant thunder, uniformly attends the flowing of the oil, whilst the gas which is there visible every day at the top of the pump, leads the passing stranger to inquire whether the well is on fire.

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* Upon the plantation of Winbon Lawton, Esq. of James-Island, this plan has been adopted. The consequence is, Mr. Lawton's negroes are considered as among the most orderly and best disciplined on the Island.—*Editor*.

From the Cultivator.

CULTIVATION AND HARVESTING OF INDIAN CORN.

All, or nearly all, the accounts we have published of great products of Indian corn, agree in two particulars, viz. in not using the plough in the after culture, and in not earthing, or but very slightly, the hills. These results go to demonstrate, that the entire roots are essential to the vigor of the crop; and that roots, to enable them to perform their functions as nature designed, must be near the surface. If the roots are severed with the plough, in dressing the crop, the plants are deprived of a portion of their nourishment; and if they are buried deep, by hilling, the plant is partially exhausted in throwing out a new set near the surface, where alone they can perform all their offices. There is another material advantage in this mode of cultivating the corn crop—it saves a vast deal of manual labor. See the communication of Mr. Tomlinson, in to-day's paper.*

There is another question, of interest to farmers, which relates to the mode of harvesting the crop; that is, whether it is best to top the stalks, cut the whole at the ground when the grain is glazed, or cut the whole when the grain has fully ripened. We have stated the experiments of Mr. Clark, of Northampton,† one of the best practical farmers of our country, and of other gentlemen, showing, that the grain suffers a diminution of six or eight bushels the acre, by topping the stalks; and there seems to be no counterbalancing benefit in the fodder, unless at the expense of carrying the stalks to the borders of the field, that they may be secured before the crop is gathered, and before they become blanched and half ruined. And it is no protection against early autumnal frosts, but rather exposes unripened grain to be more injured. Hence, so far as regards these two modes, all who have made a comparison, seem to concur in the opinion, that stripping the corn of its tops and leaves, is a bad practice. William Carmichael, of Maryland, has given us, in the Farmers' Register, his experiments in this matter, which go to corroborate the conclusion we have drawn. He took, promiscuously, one hundred ears from corn that had been topped, and one hundred ears from that which had not been topped, growing side by side. The first weighed, on the cob, 50 pounds; shelled, 41 pounds, and measured 21 quarts, 1 pint. The other on the cob, 54 pounds; shelled, 46—and measured 26 quarts—showing a difference of nearly one-fifth in favor of the unstripped or untopped corn. The fact is, that topping not only prevents the further elaboration of the sap, which can only take place in the leaves, and which is necessary for the growth of the corn, but it deprives the grain of much that is already elaborated, and on its way to the grain. If a fruit tree is deprived of its leaves, before the fruit has attained its growth, or mature flavor, the fruit will no longer grow, nor will it attain high flavor, for its supply of elaborated food, or vegetable blood, is cut off by the loss of leaves. We have noticed this particularly in the plum. Satisfactory experiments have not been made to determine, whether it is most advantageous to cut the crop when the grain is merely glazed, or to wait till it is perfectly ripe. This will depend upon the amount of loss, if any, in the grain, by early harvesting—the relative value of the grain and fodder—and the prospect of both being injured by early frosts—for neither are liable to suffer from frost after the crop has been cut and put into shooks. It is to be noticed, that, in early cutting, the stalks are succulent, and abound in elaborated sap on its descent from the leaves to the grain, and that this supply of food to the grain continues to flow probably for some days after the corn is in shook, and if so, the grain itself continues to improve, though we think it likely that the crop undergoes some trifling diminution. But if frost is likely to intervene, before the complete maturity of the crop, there is no doubt but the corn will suffer less in shook than it will standing, while the fodder will be materially injured by frost. Admitting that there is a small loss in grain by early cutting, though it is undoubtedly less than when it is topped, the difference in the value of the fodder, under the two modes of management, is vastly in faver of early harvesting. We do not pretend to calculate to a nicety, the difference in nutritous properties of corn stalks cut in a succulent state, early in September, well cured and well housed, and those left standing till October or November in the field, but we should think it fifty per cent. Well cured corn stalks afford an excellent winter food for neat cattle; and when fodder is likely to be in demand, they may be made to contribute largely to the profits of the farm. Several of our acquaintance have kept their neat stock almost entirely upon this fodder during the past winter, and we have done the like, having first cut ours in a cutting machine; and so far as we can learn, the cattle kept upon them are in excellent condition.

The preceding considerations justify us in recommending, that in the management of the Indian corn crop, the following rules be observed, at least partially, so far as to test their correctness:

1. That the corn harrow and cultivator be substituted for the plough in the culture of the crop.
2. That the plants be not hilled, or but slightly so—this not to prevent the soil being often stirred and kept clean. And,
3. That in harvesting, the crop be cut at the ground as soon as the grain is glazed. Ed. Cult.

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"The two last years, corn has been raised in the following manner, on the Mohawk Flats, near this city. If in grass, the land is ploughed and well harrowed, lengthwise of the furrow, without disturbing the sward. The ground is then prepared for planting, by being marked out two and half feet one way, and three feet the other. The last season, the field was rolled after being planted, with evident benefit, as it made it level. When the corn is three inches high, the cultivator is passed through both ways: and twice afterwards it is used in the same manner; no hills are made, but the ground is kept level. Neither hand hoe, nor plough are used, after the corn is planted. Fields, manured with coarse manure, have been tilled in the same manner. Corn, tilled in this way, is as clean of weeds, as when tilled in the usual way; it is no more liable to be blown down, and the produce is equally good. It saves a great deal of hand labor, which is an expensive item in the usual culture of corn. Last October, ten rods were measured out, in two different places, in a corn-field, on grass land—the one yielded ten, the other nine bushels of ears. In one corn-field, after the last dressing in July, timothy and clover seed were sown, and, in the fall, the grass appeared to have taken as well as it had done in adjoining fields where it had been sown with oats," * * * * *

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* An extract from the piece referred to will follow this. Ed. Far. Reg.

† Published also in the Farmers' Register, p. 243. vol. II.

CHARLES H. TOMLINSON.

NICOTINE.

Mr. Davy described some experiments which he had made in reference to the relative values of Virginian and Irish tobacco. He procured nicotine by simply digesting the leaves in potash, and then distilling. A liquid, possessing uniform qualities, passed over. The liquid is acted on by acids, affording salts possessing a sharp biting taste. The effect of the liquid was tried upon different animals, and found to be highly narcotic. He found that one pound of Virginian tobacco was equivalent to two and one-third of Irish tobacco; the root containing four or five per cent. of nicotine. The usual estimate of the relative values, is as one to two.—*Arcana of Science.*

TRIFOLIUM INCARNATUM.

The cultivation of this plant is, we are glad to hear, spreading rapidly; and it is in some parts of the country very generally taking the place of tares, as it produces a much greater quantity of food, and does not require much more than a tenth of the labor bestowed in preparing the ground and sowing it. It also comes in a fortnight earlier. *Loudon's Gardener's Magazine.*

TENNESSEE LAND AND FARMING—LIMESTONE—LIME—LUCERNE.

Columbia, Maury County, Ten.
May 4, 1836.

To the Editor of the Farmers' Register.

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I have, thus far, been very much pleased with the Register. I hope it will continue to be as interesting as it has been. It might, perhaps, be rendered more acceptable to your patrons in this section, if you would devote more space to cotton, stock, and grass. Our climate and soil are well suited to those subjects, and they engross the chief attention of our agriculturists. We are not much of a wheat-growing people. Our climate does not suit it. It freezes out of the ground in the winter.

While I am writing, I will call your attention to an article in your last number, of much importance, but which I do not sufficiently understand, and which I will thank you to explain. In the essay, translated from the *Annales de l'Agriculture Française*, page 743, is described a sure remedy for smut in wheat. In describing the quantity of lime and of sulphate of soda, the terms "*hectogrammes*, *kilogrammes*, *hectolitre*," are used, which are not sufficiently explained to a person who cannot "*parlez vous*." I will thank you to give them a more definite exposition in English measures. One other subject I will thank you to give us all the information about, you can obtain, which is of great importance to this country, and that is the use of lime as a manure or improver of soils. This is a limestone country. We have it in great abundance, and no other kind of stone. But how to use it on our lands, in what quantities, and how to tell whether our soils require such improvement, we do not know. Perhaps you may be able to give us some plain directions in the particulars. If you can, it will be very acceptable.

I have but little experience in farming, as I have but lately turned my attention to it. I will mention an experiment I commenced last year, with lucerne. I sowed about one-third of an acre near my stables last spring, in April, in drills two feet apart. I commenced cutting it in September, and cut it three times before frost. I have now cut it nearly over the first time this season, and where I began first to cut it, it is as high as when I first began. I work eight plough horses and mules, and have four other horses that do not work, and four milk cows. I give them all a full feed of it every day, and they cannot consume it near so fast as it grows. I find it very valuable. It requires but little labor to cultivate it, and contributes greatly to the health of my work horses. * * * *

[The several articles on lime and calcareous manures, recently given in this journal, will serve, it is hoped, to furnish much of the information on that head, desired by our correspondent. If he had been a reader of the earlier volumes, he would have seen that much space has been there given to the subject of live stock, and their management: and that more has *not* been given, and of information more especially suited to the western breeders of cattle, is owing to the circumstance, that, *from their pens*, this journal has received scarcely any aid. Let them commence to write—to commmuuicate ever so little that they *know* of what is useful, in each particular case—and to inquire for the much more abundant supply of information that each writer may *need*—and it may be relied on, that the scarcity in this particular department of our journal will no longer be a matter to complain of. If a subscriber is anxious to *read*, and to *learn*, on any particular subject, we advise him forthwith to *write* on it, as the best means to attain his object speedily and effectually. In this manner, our respected correspondent may help himself, and at the same time greatly help the Farmers' Register.

With regard to the explanation of foreign weights and measures, we have given it generally, and also in reference to particular casas, in several different parts of this journal. (as at p. 505, vol. 2, p. 745, vol. 3, &c., &c.) Still, as it may not be always convenient to refer to such foregone explanations, a convenient abridged statement will be now annexed.]

FRENCH WEIGHTS AND MEASURES, COMPARED WITH ENGLISH OR AMERICAN.

One metre is equal to 3.2809167 English or American feet, nearly three and three-tenths—or three feet and eleven lines, or 3.078444 of the ancient French measure.

From the *metre*, the fundamental measure, all others are formed, either by multiplying or dividing by tens: thus, in measures of length—

A Deca-metre is equal to	10	times the metre.
Hecto-metre do	100	do
Kilo-metre do	1000	do
Myria-metre do	10,000	do
Deci-metre is the	10th	part of a metre.
Centi-metre is the	100th	do
Milli-metre is the	1000th	do

The same prefixed syllables, attached to any other measures, in like manner, designate a similar increase or decrease of amount, always by tens.

The following are some of the French weights and measures, most commonly mentioned, with their equivalents given in English and American, in whole numbers and decimals.

Linear measures.

French	English or American feet.
Metre, (as above,) equal to	3.2809167
Deca-metre	32.809167
Hecto-metre	328.09167
Kilo-metre	3280.9167
	Inches.
Deci-metre.	3.9371
Centi-metre	0.39371
Milli-metre	0.039371

Square, or land measures,

	Square feet English.
Centi-are, (or square metre,) equal to	10.764414392S
Deci-are	107.644143928
Are	1076.44143928
Hect-are (100 ares)	107644.143928, or 2.473614 English acres, or nearly 2½.

Measures of Capacity.

The unit, both for liquid and dry measure, is the *litre* which is equal to a cubic *deci-metre*, or 1.760773 English pints, or not quite 1$\frac{8}{10}$. The Winchester bushel, (the English and American measure,) contains 2150$\frac{3}{7}$ English cubic inches.

French.	English or American. Cubic inches.	
Litre, (as above,) equal to	61.028	or pints, 1.760773
Deca-litre	610.28	or gals. 2.2009667
Hecto-litre	6102·8	or gals. 22.009667

Weights.

The gramme is equal to	15·438	grains Troy.
Kilo-gramme	2.68027	pounds Troy;
	or, 2.20548	pounds avoirdupois·

A more full list of French weights and measures, and an account of the plan of their arrangements, may be seen at p. 505 to 508, Vol. III.

REPORT ON THE SURVEYS FOR THE CITY POINT RAIL ROAD.

To Messrs. G. W. Harrison, A. B. Spooner, J. D. Townes, Patrick Durkin, William Robertson, E. James, and John A. Peterson, Commissioners under the Act of Assembly, incorporating the City Point Rail Road Company.

The following report of a survey made by your order, is respectfully submitted.

After an examination of the country, between Petersburg and City Point, two routes presented themselves, and as the decision of the question of preference between them, may involve considerations of private interest, it was thought most prudent and advisable to survey and report both, and leave the decision of the question of preference to those most interested.

When we speak of two routes, it is not to be understood, that there are two separate and distinct routes throughout the entire line. From the topographical features of the country upon the line of the contemplated improvement, it was found that a portion of the distance intermediate between the extremes, admitted of being selected as a route common to both lines. This, it will at once be perceived, naturally divides our work into three parts. The first division extends from Petersburg to a point about one half mile east of Mr. Peyton Mason's house, where the two lines unite; from which point, the common line, which forms the second division, preserves a perfectly straight course, to a point within one mile of City Point, very near the forks of the road leading from that place. The portion from this point, for the sake of convenience of reference, may be called the third division. With these preliminary explanations, we can now proceed with greater facility to a more particular description of the two lines of the survey.

For the sake of distinction, I have called the two routes by the names of the northern and southern routes.

We will now commence with the northern route, which begins at Bollingbrook Street, and continues along the margin of the Appomattox River, to the lower end of the plantation of A. B. Spooner, Esq.—from thence, it pursues a straight line through the flat lands of Mr. Nath. Friend, Mrs. Jordan, and Mr. Knox, and ascends the ridge, by a branch to the left of Mr. Peyton Mason's, where it curves gently to the right for one half mile, and from thence, pursues a perfectly straight line to City Point, and communicates with the river at the steamboat wharf. Upon this northern route, there need not be an inclination greater than 20 feet per mile, and but four curves, of a radius exceeding two thousand feet each.

The southern line commences at the depot of the Petersburg and Roanoke rail road, and passing along in the street leading from the same, crosses the run between Petersburg and Blandford, and continuing on in the same straight line, leaving the New Market race course to the left hand, crosses Skipper's run—here the line ascends the ridge by following a hollow or ravine near to, and lying southward of Mr. Nathl. Friend's house, by an inclination of 25 feet per mile. From this place, it is a straight line to where it joins the former line at the point already designated. From this to the other point, one mile from City Point, designated as the termination of the second division, the two lines are common to both surveys. From this last point, it curves to the right, and communicates with the James River at a point 3500 feet below the communication of the other line with the river.

The following statements, in tabular form, will show the undulations, or grades of ascent or descent of the two lines, which are remarkably favorable to the application of locomotive engines, as is also the direct course those lines pursue.

Northern line beginning at Bollingbrook Street.

No of Sections.		Length of the sections in feet.	Total ascent or descent in the section in feet.	Length of a position of the line corresponding to an ascent or descent of 1 foot.	No. of feet ascent or descent per mile.
1	Descent	5,220	3,00	1740	3,03
2	Ascent	5,560	24,00	231	22,38
3	Descent	1,540	1,00	1540	3,42
4	Ascent	10,600	53,00	200	26,40
5	Descent	3,590	8,00	448	11,76
6	Ascent	2,560	5,00	512	10,31
7	Level	1,450			
8	Descent	6,630	31,00	214	24,68
9	Ascent	1,360	4,00	340	15,52
10	Descent	4,750	11,00	431	12,22
11	"	2,900	10,00	294	17,95
12	Level	2,773			

Southern line beginning at the Depot of the Petersburg and Roanoke Rail Road.

No. of Sections.		Length of the section in feet.	Total ascent or descent on the section in feet.	Length of a portion of the line corresponding to ascent or descent of 1 foot.	Number of feet ascent or descent per mile.
1	Descent	2690	12,00	224	23,55
2	Ascent	7150	5,00	1430	3,69
3	"	6021	34,00	177	29,81
4	"	2680	5,00	536	9,85
5	Descent	5600	17,00	329	16,02
6	Ascent	420	2,00	210	25,14
7	Descent	3490	8,00	436	12,10
8	Ascent	2560	5,00	512	10,31
9	Level	1450			
11	Descent	6530	31,00	210	25,06
10	Ascent	1360	4,00	340	15,52
12	Descent	4010	10,05	381	13,82
13	"	2480	9,00	275	19,16
14	Ascent	3800	2,00	1900	2,77

	Miles.	Yards.
The distance in a right line from Bollingbrook st. to City Point,	8	1335
The distance in a right line from Petersburg and Roanoke rail road depot to City Point, is	9	445
Length of the northern line	9	484
Length of the southern line	9	907

From which it does appear that the northern line exceeds a right line between its two extremes by 907 yards.

And the southern line exceeds a right line between its two extremes, by 462 yards.

And that the southern line exceeds the northern line by 403 yards.

Estimate of the cost of the two lines are as follows:

NORTHERN LINE.

138,752 cubic yards of excavation, at 12½ cts. per yard	$17,344 00
184,811 cubic yards of embankment, at 15 cents per yard	27,726 60
1,284 cubic yards of masonry, at $5 per yard	6,420 00
850 cubic yards of masonry for culverts, at $3 per yard	2,550 00
800 cubic feet for dry walling, at $2 50 cts. per yard	2,000 00
Three miles of grubbing, at $300 per mile	900 00
Nine miles, 1453 feet of superstructure, at $4,000 per mile	37,101 08
	$94,041 68

SOUTHERN LINE.

170,942 cubic yards excavation, at 12½ cents per yard	$21,367 75
44,500 cubic yards embankment, at 20 cts. per yard	8,900 00
113,759 cubic yards embankment, at 15 cents per yard	17,063 85
1,800 cubic yards masonry, at $5 per yard	9,000 00
1,000 cubic yards for culverts, at $3 per yard	3,000 00
Four miles grubbing, at $300 per mile	1,200 00
Nine miles 2721 feet superstructure, at $4,000 per mile	38,061 76
	$98,593 36

The following estimate of machinery and fixtures is to be regarded at the least with which the Company could conveniently commence operations with any degree of efficiency; after which, the increase of business upon the road will indicate the necessity of a gradual increase in the quantity of machinery.

2 locomotive steam engines, at $6,000 each	$12,000
12 passenger cars, at $750 each	9,000
20 burden cars, with springs, at $300 each	6,000
And for depots at each end of the road, say $5,000 each,	10,000
	$37,000

Before closing this report, I think it proper to remark, that in case it should be determined to approach the James River at the lower point, I am of opinion that an improvement in the line might be effected by a change of the route more southerly, which would aviod some deep excavation through a ridge at the corner of Weston fields. The estimates submitted comprehend a proper allowance for contingencies. I herewith hand a map of the survey.'

JOHN COUTY,
Civil Engineer.

For the Farmers' Register.

SURPLUS REVENUE.

There is no subject which at present seems to command a larger share of the public attention than that of our surplus revenue. The immense moral and political influence which an overflowing treasury is likely to exert throughout the whole extent of our wide-spread territory, is a matter of too palpable and striking a nature to escape the public view. The consequences of this character are really alarming, and calculated to inspire the patriot with serious apprehensions for the continuance of that virtue and political integrity in our people, which Montesquieu has but too truly asserted to be the vital principle of republicanism. I have not taken up my pen, however, to portray these effects. Others, far abler than myself, with all the power of their eloquence to sustain them, have forced the public mind into contemplation of the subject under this particular aspect. Besides, an agricultural journal is not, perhaps, the proper receptacle for discussions of this character.

There is one view, however, of this important subject, (of a politico-economical character,) which seems, as yet, to have made no serious impression on the public, though certainly I think of the highest moment. It is this: '*that a large surplus revenue must necessarily keep the whole monetary system of our country in a constantly unsteady and deranged condition; and this, too, in spite even of all the efforts of government to prevent it.*

The *modus operandi* is easily explained. Every one at all acquainted with the complicated concerns of trade, knows the vast importance of the currency to the harmony of all its operations, and at the same time, the extreme sensitiveness of this important portion of the capital to every thing which affects either its quantity or the velocity of its circulation. Of all the parts of the currency, none is more important than the *money*. This is peculiarly important as a general measurer of value throughout the country. Now, that which increases or diminishes its quantity, all other things remaining the same, must necessarily raise or depress prices, and a continuanee of such vacillation as this, throws the country into the utmost confusion and disorder, and seriously deranges all the operations of trade.

Our surplus revenue does, and must *inevitably* continue, to produce such disorder and vacillation as I have just spoken of. Mr. Gallatin, some years ago, estimated the money in actual circulation in our country at about $120,000,000. Now, suppose our surplus revenue to be $40,000,000, and of course, liable to be collected in money. Here, then, we have the government in possession of one-third of all the money in the country. Suppose that government should suddenly collect the whole of this revenue, and lock it up, if you please, in the strong boxes of the treasury, what would be the consequence? Why, one-third of the money is suddenly abstracted from the circulation, and the consequence would be a pressure in the money market, as sudden and terrible as an earthquake. Destroy one-third the corn, wheat, or meat, now in use, and we all know what would be the dreadful result. This abstraction of the currency is precisely equivalent to a destruction of one-third of the money of the country as long as it is withheld from the circulation. How would this pressure be relieved? By gradual importation of specie from abroad, and by gradual extension of bank issues. until the deficit occasioned by the abstraction of $40,000,000, was supplied, and the trading community were again in possession of $120,000,000, the sum necessary for the functions of circulation. Suppose, now, the government should determine to disburse the money, no matter in what manner, which has been for a time withdrawn, what would be the effect? You would then have the money of the country suddenly raised to $160,000,000—$40,000,000 beyond the usual amount. The effect of this would be, a sudden elevation of prices, soon followed by a rage for speculation, finally to be cured by large and extravagant importations from abroad, which would create a money balance against us, and drain us of specie, and force a system of curtailment on the entire banking system throughout the country. In the mean time, the accumulation of another surplus would force the country through the same melancholy routine of grinding pressure and bloated prosperity, equally hostile to a pure and sound state of morals, and to a steady and constant accumulation of wealth. But I have said this effect would be produced by a large surplus revenue, *in spite* even of all the efforts of government to prevent it. In our country, the revenue is deposited in certain banks chosen for the purpose; and where the revenue annually collected is annually disbursed, there is no danger of a pressure from this cause, because the deposites of the government are made and withdrawn with some degree of regularity, and the deposite banks can easily conform their operations to those of the government without any detriment to the public. But when a surplus revenue of $40,000,000 is deposited in a certain number of banks, the case is far, very far different. The expenditure of such a revenue is a very uncertain event. It may be demanded of the banks tomorrow, or it may not be for years. To-day, Congress is not in session, and there is no danger of an appropriation. The consequence will be, that the deposite banks will enlarge their issues, and flood the country with paper. To-morrow, Congress is convened, and apprehension is entertained that this enormous surplus may be called for. The consequence is, the deposite banks must place themselves in a position of safety; they must curtail their issues; gather together their funds in order that they may be ready to obey the summons of the government. This curtailment, on the part of the deposite banks, forces a similar line of policy on the others, and hence a money pressure. After a short time, Congress either appropriates the money, or rises without any action on the subject. In either case, the currency will again become suddenly expanded, because of the restoration to the circulation of that portion, so long held in a state of inactivity to meet the public calls.

The great pressure now felt in the large cities, is an exemplification of the views here submitted, and shows, most conclusively, that while Congress *involuntarily* holds suspended the sword of Damocles over the deposite banks, they must and will produce a money pressure, and a consequent derangement of the whole monetary system. Nothing but a guarantee that the money will not be called for without years of notice in advance, can possibly prevent these disastrous fluctuations in the currency of our country, as long as we have a large surplus revenue constituting so very considerable a portion of the circulating medium.

This tremendous, and I may truly say, most awful influence over the whole trade and prosperity of the country, exerted by the mere existence of a great surplus revenue, is one of those overwhelming evils which statesmen scarce dream of before they happen. I do not recöllect ever to have heard or seen one single prediction of any such calamity as this, from an overflowing treasury. And even now I do not think our statesmen seem sufficiently impressed with the deleterious influence of our surplus upon the whole monetary system. In fact, if this view of the subject has been presented to the public at all, it has not met my eye. Now, when we consider that the surplus will increase for several years to come, and that if our government shall be as economical in its expenditures as it ought to be, the surplus may amount, before 1842, to a sum equal to all the money requisite to perform the functions of circulation in this country, the most vivid imagination can scarce conceive the disastrous consequences of such an accumulated treasure. The value of every item of property in the whole country will depend "upon the hazard of a die." The sudden hoarding on the part of the deposite banks to meet the calls of government, would instantly paralyze the whole business of the country, and inflict a death-like torper on all the operations of commerce. The sudden abstraction of so much money from circulation would at one blow annihilate all exchangeable value, and leave debtors every where at the mercy of creditors. A sudden restoration, after such an abstraction, would again restore the currency, raise prices, blow up the bubble of speculation to burst once more with the same melancholy consequences. When we take into consideration, that the construction of turnpikes, rail roads, canals, the building of factories, and the forming of joint stock schemes throughout the country, are rapidly increasing the amount of stocks; that all these stocks are exceedingly sensitive to all the fluctuations in the money market, rising to-day and falling to-morrow; that these fluctuations in the stock market generate a gambling spirit, at once destructive of the morals and religion of the country, and fatal to the formation of those steady and persevering habits of industry which alone can insure the steady accumulation of national wealth. We cannot but the more lament the existence of a great surplus revenue, which must, of necessity, increase immeasurably all these evils. These fluctuations are not matters of chance, or the result of intentional oppression by the government; they are the necessary and inevitable results of the surplus revenue. Distributions of such revenue regularly among the states, seems to be the only remedy left, if the tariff compromise of 1832 is to be considered as sacred and inviolable. That would not perhaps be found a complete remedy, but it is certainly the best that has yet been offered.

If ever the Congress of the U. States was called upon to settle a difficult and momentous subject, it is this subject of the surplus revenue. I wish that every man in the United States could be made to see the truth, that the whole property of the country is involved in this question of the surplus revenue. If it is suffered to advance until it absorbs all the money of the country, the value of every house, of every foot of land, of every species of produce and property, will be at the mercy of these fluctuations, occasioned by the contractions and expansions of the currency caused by the existence of an overgrown surplus revenue. And all this will happen, whether the government should wish to oppress or not. The power of the government becomes most fearfully great, with a large accumulated revenue, and the best government in the world, with such a fund, becomes like Ahmed, the Pilgrim of Love, in the *Tales of the Alhambra*, when cased in the enchanted armour, and mounted upon the enchanted steed: an impetus was given to him which drove him furiously against friend and foe, in spite of every effort to restrain himself, until he had prostrated in universal ruin all who lay before him.

I hope this, my hasty sketch of the influence of the surplus revenue, will at least have the effect of calling public attention to the subject.

Z. W.

From the Athenæum.

RAILWAYS IN PROGRESS IN ENGLAND.

Under the head of railways now in progress of construction, we find several schemes surpassing in magnitude any that have hitherto been accomplished. Our notice of these must be confined to the most important: the review of which will most appropriately commence at the southern extremity of the great line, proceeding from the shores of the channel to the north of Lancashire, with the *London and Southampton* railway. This line proceeds from Southampton, passing near Winchester and Basingstoke, to the north of Guildford, by Wimbledon, to Vauxhall, London, a distance little short of 75 miles; for which, the estimate was, as far as we can remember, 1,000,000*l.* From the excessive difficulties of the country, and the consequent heaviness of the works, we should be inclined to suppose it will probably require at least 2,000,000*l.* for its completion. The Act of Parliament was obtained in 1834.

A project, under the name of the *Great Western* Railway, for connecting London with Bath and Bristol, a distance, by the proposed line, of about 120 miles, with an estimate of 2,500,000*l.*, was first entertained two years ago. The eastern termination is on the Birmingham line, about 4 miles from the station in London. The Act was obtained in the session of 1835, after a contest of almost unexampled severity; and we perceive that the works, some of which are heavy, including a long tunnel on an inclined plane at Box, are in progress.

The next in succession, northward, is the *London and Birmingham* Railway, passing by the valley of the Brent, Watford, Berkhampstead, Fenny Stratford, near Northampton, Daventry, Rugby, and Coventry, to Birmingham, a distance of 111½ miles. The estimate for this line, which, from the nature of the district traversed, must be expensive, is two millions and a half; and the whole distance will, probably, be completed in the course of the year 1838. The works are proceeding with great activity, and, at each end of the line, a certain number of miles will be opened this year, as we learn. There will be several tunnels required to carry the line through the different ridges that cross its course: one of these, at Watford, will exceed a mile in length: an objectionable, but, it is said, inevitable feature of this railway—the chief dependence of which must, of course, be on passengers. By this means, however, good levels have been secured, and the distance will easily be performed in five hours and a half.

From Birmingham, the line is continued northward by the *Grand Junction* Railway, proceeding from the London Railway by Wolverhampton,* Penkridge, Stafford, to the west of Newcastle and the Potteries, through Cheshire, to Warrington; at which point it takes up a branch railway already made, and pursues it to Newton, a point on the Liverpool and Manchester Railway, equidistant from these towns. The total length, including the Warrington and Newton line, is about 82 miles; the estimate of its cost, 1,100,000*l.*: it will probably require, including the expenses of a carrying establishment, a million and a half. The district traversed, presents, in general, fewer obstacles than are met with on the London line, and will require no tunnels; there are, however, some works of great magnitude at different points, among which may be named the great viaduct across the valley of the Weaver, in Cheshire, consisting of twenty arches, of sixty feet span, and more than sixty feet above the level of the valley. The works are rapidly advancing, and the road, it is expected, will be opened, throughout its entire length, in the summer of 1837. About four hours will be occupied in traversing it.

At Newton, another branch line, formerly known as the Wigan Railway, has been incorporated with one at present in progress, which will complete the entire distance of 21 miles, from Newton to Preston, under the title of the *North Union* Railway. The cost of this, including the improvements which must be made in the Wigan and and Newton division, will not be much less than 500,000*l.*: the works have already made some progress, and will, it is expected, be completed in 1838. There are a few heavy excavations on the line, and a viaduct, now building across the valley of the Ribble, at Penwortham, which will be a handsome but expensive work.

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* It is intended to carry this railway over the valley of the rivers Tow and Ouse at Wolverhampton, by a viaduct consisting of 6 elliptical arches, each of 60 feet span, with piers of 10 feet thickness. The arches will spring at about 21 feet 6 inches above the general level of the ground, and the line of the surface of the rails will be about 49 feet above the same surface: the width between the parapets will be 20 feet clear. The abutments will be finished in front with pilasters; the wings will have arched openings, and the extremities of the wings will be finished with pilasters. The rivers will be turned under the arches in a paved channel.

We find, at the northern end of the North Union Railway, the *Preston and Wyre* Railway, for which an Act of Parliament was obtained last year. It is connected with a proposed extension of the Harbour of Wyre, at the southern side of Lancaster Bay, where, it is hoped, a port of some consequence may spring up: the distance may be about five miles. This short link completes the communication between our northern and southern waters—a length of nearly 300 miles, the expenditure on which will exceed six millions sterling.

Returning to London, we discover, at the foot of London Bridge, the commencement of the *London and Greenwich* Railway; a singular work, conducted, throughout its whole length of 3¾ miles, on a succession of irregular arches, the ground below being already appropriated. The number of these arches will be from 900 to 1,000, averaging 22 feet in height from the ground; the longest structure of the kind, we believe, in the kingdom. The estimate is 400,000*l.*; the works were begun in 1834, and are now far advanced.

From Loudon's Gardener's Magazine.

A TREE DAHLIA.

In the beginning of August, 1835, I went to Liverpool. At the old botanic garden there I saw an arborescent dahlia growing: it is a cutting, resembling a middle-sized trunk, or small stem, of an elder birch, as thick as one's leg, and fully as woody as the elder. The plant is said to grow forty feet high in Mexico. It was throwing out leaves very like those of our herbaceous species.

From the London Mechanics' Magazine.

SUGAR FROM INDIAN CORN.

M. Pallas lately presented to the Academie des Sciences of Paris a sample of this substance, extracted from the stem of the plant, which has been found to contain nearly 6 per cent. of sirop boiled to 40 degrees, a part of which will not crystallize before fructification; but it condenses and acquires more consistency from that period to the state of complete maturity. The most favorable time to obtain the greatest quantity of sugar, is immediately after the maturity and gathering of the fruit. The matter left after the extraction of the sugar, is capital to feed cattle, or to make packing paper.

From Burnett's Botany.

NATURAL HISTORY OF RICE.

The rice, (oryza sativa,) if estimated by the proportion of food it contributes to the sustenance of man, is the most valuable of all the grasses, and perhaps the most useful vegetable grown; as the unnumbered millions of the east are supported almost wholly on this corn, for the growth of which the extensive swamps of those hot countries, and their unrivalled means of irrigation, are so peculiarly adapted. Rice is the staple corn of the tropics, as the oat is of the northern, and wheat of the temperate regions. The culture of rice is an exceedingly unhealthy occupation; for the frequent flooding of the fields keeps them constantly in a swampy state, and favours the production of malaria. Rice has been raised in England on the banks of the Thames, a crop having been once tried and gathered in near Windsor. In Italy it is cultivated with success; but artificial irrigation has been carried there to a higher degree of perfection than in any other part of Europe. Still it shrinks into insignificance if compared to the gigantic labors of the east, as will appear from the following account.

Between the fort of Nundydroog and the rising ground on which we stopped to view the prospect, there extended a valley some six or eight miles across, the whole bottom of which was marked with a succession of artificial tanks, used for irrigating myriads of rice fields lying below the level of these reservoirs.

The table-land of Mysore, which is several thousand feet above the level of the sea, is not strictly a flat plain, as the name would imply; neither is it mountainous, nor even very hilly: and yet the surface is extremely uneven, being moulded into gently sloping ridges, which form between them a succession of long valleys slightly inclined, broad and shallow, and winding about in all directions. Across almost every one of these valleys, the natives have thrown embankments, some of them of very ancient date, though some of them are even so recent as the dynasty of Hyder. These walls, or *bunds* as they are called, are made of considerable strength, and when they are small generally curve upwards, so as to offer the convex side to the pressure of the water; but if they be a mile, or several miles in length, the embankments assume a waving snake-like shape; I suppose from some idea of strength. One valley was pointed out to me about a mile broad and forty miles long, from end to end; this included between thirty and forty tanks, some large and some small, every square yard of the intermediate space between the bunds being richly cultivated, while the surrounding country appeared to be condemned to nearly perennial sterility. I believe that the whole rice crop of Mysore is derived from irrigation.

This vast supply of water is gained partly by the method of the tanks just described, and partly by tapping the Cauvery and other rivers by means of subaqueous dams built, during the dry season, diagonally across the bed of the stream. The effects of these dams is to direct a portion of the river into lateral trenches, stretching far and wide over the country. From these it is again drawn off to water the rice fields. I remember hearing a traveller describe the mode in which the great river Indus is tapped or drawn off in this manner, to the right and left, for the purposes of agriculture, until the unhappy stream is fairly exhausted, and its channel left dry. One is so much accustomed to consider the mighty mass of water, forming a river of any magnitude, as something beyond the power of man to control, that it requires good evidence to satisfy our credulity on this point. But if the Indus, in the districts alluded to, resemble the Mississippi and many other streams flowing over extensive alluvial countries, there need be no difficulty in conceding such a transfer of the whole of its waters, from the ordinary bed of the stream to the fields on either side; because rivers which traverse deltas almost invariably flow along the summits of ridges somewhat higher than the adjacent country. These ridges, it is true, are so wide and flat, that their elevation, at most places, can scarcely be detected by the eye; but still the inclination of their sides is abundantly sufficient to admit of water draining away from, instead of flowing towards, the river.

But as such rivers are liable to overflow their banks during the rainy season, it becomes necessary, in order to prevent the country being inundated, to raise walls or embankments to confine the streams. These being raised a little higher than the surface of the river at its highest, confine the stream within proper limits. But as the floods of each successive year bring down a prodigious mass of gravel and sand, the wear and tear of the mountains, fields, and forests, through which the tributary streams have passed, a certain portion of the largest and heaviest of these materials must subside, and remain at the bottom when the river reaches the low grounds, where its rate of motion is much diminished. This addition, though it be small in any one year, gradually raises the bed of the river. If this rise were not carefully met by a corresponding annual elevation of the artificial embankment, it is obvious that the water, in the course of time, would periodically overflow, and inundate the country. The consequence of these alternate struggles between the waters trying to escape, and man insisting on confining them, has been to lift the whole body of the Cauvery, in its passage across the Carnatic, several feet above the highest level of the surrounding country. The supply of water so curiously raised into the air, is exclusively appropriated to the irrigation of the country.

In the upper lands of Mysore, the peasants are dependent chiefly on their tanks for moisture, as the rains are uncertain in quantity, and transient in their effects. The stock of water collected in these numberless and extensive tanks, many of which well deserve the name of lakes, is capable of being distributed to the precise quantity and at the precise times required. I have been often amused at observing with what scrupulous care the persons appointed to distribute the water, let it off from these magnificent reservoirs. The thirsty soil of the Mysore, parched and riven by heat, drinks up the fluid with a kind of relish—a sort of animated enjoyment, at which I was never tired of looking.

In describing things which lie so much out of the ordinary course of observation, one becomes sensible of the poverty of language. Thus the word tank suggests, to most people, the idea of a common cistern attached to a dwelling house, and filled with rain water from pipes along the roof. The word pond, again, recalls images of muddy water, draggled post horses, rank weeds, and a combined fleet of ducks and geese engaged in common warfare against frogs and worms. To call the tanks of Mysore by the name of lakes would be near the mark, for many of them well deserve that appellation. The *Moola Talou*, or rich tank, for example, near Seringapatam, I understand, is nearly thirty miles in circumference. I never saw that particular sheet of water, but many of the artificial lakes which I did examine, measured six, eight, and ten miles round; and so vast are their numbers, that I remember counting considerably more than one hundred at one view from the top of Nundydroog; nor do I believe that the least of them could have been less than two or three miles in circuit.

Dr. Buchanan, in his journey through those countries, made by order of Lord Wellesley, in 1800, shortly after the capture of Seringapatam, describes minutely the formation of these tanks. The Saymbrumbacum Tank, not far from Madras, he says, is eight miles in length, by three in width, and is sufficient to supply with water the lands of thirty-two villages for eighteen months, supposing the usual rains to fail.

Rice being a water plant, renders these extensive means of irrigation absolutely necessary. The ground requires to be moistened before it can be stirred to receive the seed. When sown, it is roughly covered, trodden in by the feet of cattle driven forward and backwards over the field. When sown, the ground is immediately flooded; and during its growth is never suffered to be dry till it is ripe. The thrashing floor is a circular trench sunk on a dry spot near the field. Into this the crop is thrown as it is brought from the field, and as soon as there is a layer four or five feet thick, three or four bullocks or buffaloes are led in, and driven round and round upon the straw incessantly till the whole crop has been trodden, or until the cattle can no longer be kept in the trench. The straw is then shaken out and removed; and the grain is found in the bottom of the trench mixed with chaff, stones, and earth, which causes a great deal of labor in winnowing, to get it fit for use or market. The grain, when thus freed from the straw, is called paddy, and after being shelled by the action of a large pestle and mortar, is then fit for use under the name of rice. It is cooked by plain boiling, and eaten with the fingers. Salt is always added; and those who can afford it flavor it with spices.

Rice is imported in large quantities into this country, both from the East Indies and America. The Carolina rice is said to be the produce of a small bag, given as a present, by Dubois, the treasurer of the East India Company, to a Carolina trader; and in 1698 sixty tons were sent home. Upwards of 100,000 bags of rice are now annually imported, and the quantity is gradually increasing.

The Canada rice, *Zizania fluitans*, although not yet much cultivated, has all the natural capabilities to become a valuable corn. Its grains are large, and replete with a fine bland farina or meal. It grows abundantly in the shallow waters of North America, and has been acclimated here: it grows freely both in Middlesex and Rosshire. Attempts are being made, which, it is to be hoped, will be successful, to cultivate it in Ireland. Pinkerton says, "this plant seems to be designed by nature to become the bread corn of the North."

From the West of England Journal.

VICTORIA WHEAT.

Experiments have lately been made in the island of Jamaica, under the scientific auspices o the philanthropic Dr. Bancroft, with wheat sent by Sir Robert Kerr Porter, first to England, from Caraccas, and thence to Jamaica, the results of which experiments are stated as follows:

"The Jamaica Agricultural and Horticultural Society have received samples from three or four different places, of the wheat produced there, all of which appear to be of a favorable sort.

"First, from the mountains of St. Anne's, where the seed had been *sown the latter end of January*, and the corn *was ripe the latter end of April.* In another part of the same district, the dates of sowing differed from the above, but the wheat ripened in nearly the same period.

"Next from the mountains of St. Andrew's. On one property, Fair Hill, (about 2,000 feet above the sea) the sowing and the ripening happened at the same dates as in the first mentioned case. Of this corn, *one grain* produced *twenty-eight ears*, containing altogether *fifteen hundred grains*, (being an average of fifty-three grains for each ear.) Notwithstanding this apparent success, the proprietor of the place thinks it unlikely that planters would grow the Victoria Wheat in preference to the *Great Corn*, as it is called here, i. e. *Zea Mays*. On another plantation again, Charlottenberg, (about 4,000 feet above the level of the sea,) the seed was sown early in March, and received a top dressing: in the course of a few days it had already sprung up three inches above ground; and, as favorable moderate rains continued to fall subsequently, the corn throve well, and ripened in the early part of June, producing abundantly, grain of a larger size than the parent seed; the ears being large and full. Six of these, for instance, yielded *three hundred and thirty-six grains, weighing three ounces, making an average of fifty-six grains, weighing half an ounce*, to each ear. Mr. W. B. King, an assistant Judge of Assize, and member of Assembly, has since sent me two bundles of the ears of his wheat, and I intend to inclose one or two of them as a specimen of the produce of the Victoria wheat here. From the trial just made, Mr. King has no doubt that this grain could be cultivated in many parts of this island, and that it might become a profitable resource."

The wheat which was the subject of these experiments, was of that kind cultivated in the environs of La Victoria and San Matheo, spoken of by Humboldt, in the fourth volume of his Personal Narrative, as being sown there in the month of December, and the harvest reaped on the seventieth or seventy-fifth day, an interval corresponding with singular accuracy with the account given above by Dr. Bancroft. Of this wheat Humboldt says, that its grain is large, white, and abounding in gluten; having a thinner and softer pellicle than that of the wheat raised on the cold table lands of Mexico. He states the produce of an acre *(arpent des eaux et forets*, or legal acre of France, of which 1.95 make an hectare, being equal to about one acre and a quarter English,) as amounting usually from three thousand to three thousand two hundred pounds weight, being at the rate, for an English acre, of from two thousand one hundred and sixty, to two thousand five hundred and sixty pounds; the growth of what we may conclude to be an alluvial soil, from what Humboldt says, at page 101, of the aspect of the situation of Victoria, the approach to which was marked by the ground becoming smoother, and looking like the bottom of a lake, the waters of which had been drained off, while the neighboring hills, only one hundred and forty toises in height, were composed of calcareous tufa; their abrupt declivities projecting like promontories into the plain, and seeming by their form to indicate the ancient shore of the lake. The elevation of the cultivated ground is fixed by Humboldt at from 270 to 300 toises (about 1726.51, to 1918.35 English feet) above the level of the sea, an elevation from 81.65 to 273.49 English feet below that of Fair Hill, in the mountains of St. Andrews, Jamaica, where a single grain yielded, from twenty-eight ears, a return of fifteen hundred for one.

The seed was obtained direct from Caraccas, where Sir Robert Kerr Porter procured it from the place of its growth, and was transmitted a second time across the Atlantic, to Dr. Bancroft; hence no doubt can be entertained of its being the genuine wheat spoken of by the illustrious traveller from Prussia.

COMMERCIAL REPORT.

The commercial transactions of the present month have exhibited little activity, and there has been a decline in almost every article of foreign or domestic produce. If no other cause existed to produce these effects, the pressure for money might be adduced as quite sufficient. Without any important change in foreign markets, ours (which had been higher than those warranted,) have declined to rates more nearly proportioned to those markets, and are still such as amply to remunerate the grower.

Tobacco commands $5 to $11, not including the extreme rates of the worst and the fancy qualities. Cotton 15 to 17 cts.—Flour (country) $6¼.

Bank stocks have declined about 1 per cent., although the period for declaring dividends is nearer at hand, and large ones expected. In rail road and other stocks, there is no variation.

The distribution of the French and Neapolitan indemnities to our citizens for spoliations committed many years ago, will add some millions to the active capital of the country; but the amount is inconsiderable compared with that which has accumulated in the depositories of the national treasury, the expenditure of which to useful purposes, or its distribution, is anxiously desired by many.

To what extent the disturbances with the Indian tribes on the southern frontier may affect agriculture, and consequently, commerce, remains to be ascertained. X.

May 25.

THE SILK BUSINESS BEGINNING IN PETERSBURG.

A company has been very recently made up in this place to begin the business of mulberry and silk culture, as soon as the proper season arrives; and from our knowledge of the individuals who have commenced this enterprise, we can safely predict, that there will be nothing wanting to insure success, if zeal, energy, intelligence, and the investment of sufficient capital can command it. We rejoice most heartily in this movement—and consider it as the germ of future results of incalculable value to this region,. In all our many efforts, made through this publication, to urge the commencement and zealous prosecution of silk culture in Virginia, we have not pretended to have any personal knowledge of the particulars of the business, or the grounds on which to estimate profits. But we have assumed this general position, which we think cannot be shaken—*that if silk culture is profitable in New England*, (as it undoubtedly is,) *much more pro-*

fitable must it be, in lower and middle Virginia. We have superior advantages, (for this purpose,) to our northern brethren, in our warmer climate and longer summers—the very low prices of lands—and also in a large amount of labor, altogether suitable, and which yields nothing for other purposes. Lands in the central region, exhausted and hilly, but well suited for the growth of the mulberry, may be now bought at $2 or $3 the acre. For land of much less value for silk culture, the silk companies of the north seldom pay less than $100 the acre. So great is the difference in these respects, that we have long entertained the opinion, that by far the best course that a northern silk company could take, would be to establish its operations on a large scale on lands in Virginia.

There is an establishment already existing in Petersburg, which is admirably suited to be devoted in part to raising silk. This is the Poor House Farm. This establishment is unusually well regulated, and has already every thing necessary to carry on the silk business on a large scale, except the mulberry trees, and a cheap additional building for a cocoonery. There is enough and good land to plant—plenty of suitable labor, there being usually 30 or more young or infirm paupers, most of whom are fully competent to attend to this light work, and whom it is impossible now to employ, profitably, if at all; and moreover, there is already existing, that constant and excellent supervision and strict attention, which is indispensable to the success of the silk business, and which it would be both costly and difficult to obtain for a new establishment. Nor would the adoption of this suggestion create a rival to the silk company just formed. On the contrary, every like experiment would serve to aid and increase the lights, and to lessen, by sharing the losses, caused by inexperience, of every other new establishment. There is no danger of overstocking the silk market, even if silk was cultivated on every farm in Virginia, between the falls of the rivers and the mountains.

In all the Northern states, individuals and societies are every where going into the silk business. Many and large capitals are already invested—and every week there are annunciations of other new undertakings. No one there expresses even a doubt of the success and profit of the business: and it should be remembered that silk culture has already been carried on profitably for more than half a century in Connecticut.

Wherever the white mulberry tree grows, (no matter of what color the fruit may be,) proprietors ought to save the seeds of the present crop, as largely as possible. There can be no crop planted that will yield more profit, for sale, than the young trees, unless it be of the still more valuable Chinese mulberry. The white mulberry grows abundantly along the shores and banks of James River, and probably on all our tide waters.

PECULIAR ADVANTAGES OF VIRGINIA IN AGRICULTURAL PRODUCTS.

To the Editor of the Farmers' Register.

* * * * Virginia possesses some agricultural advantages peculiar to her position. So much of the eastern half as is favorable to wheat, (and all the soil may be made favorable,) produces that grain in the greatest perfection, and of which the flour is the best suited for preservation and use in tropical climates; and no wheat can now be advantageously raised farther south, in the tide-water region of the United States. For the latter reason, our wheat is the earliest matured that can possibly reach the Northern Atlantic cities—consequently, nature gives us a monopoly of the best markets for this product, and which are yearly and rapidly increasing in their demand. Another advantage we share with our adjacent sister States. It is, that owing to the nature and varied times of our harvests, our land can never be visited by the horrors of famine—which no degree of fertility of soil, or of industry of the cultivators, can elsewhere always guard against. In the greater part of Europe, and in many other countries, all the great crops for the food of man, are matured nearly at the same time; and a very destructive season for one of them, is likely to injure all, in a considerable degree. A general failure, or great deficiency of crops, is therefore not a very rare event—and when such scarcity occurs, an entire year must pass before another harvest can bring relief. Hence, under such circumstances, no amount of national wealth, and no foreign aid whatever, can prevent famine in a populous country, if even one-third of the usual means for subsistence should be wanting. Here, our most abundant crop, Indian corn, is fully matured at the commencement of cold weather, and its consumption is not generally begun sooner. But if previous scarcity require, its use for food may be commenced two or three months earlier. Our wheat and other small grain crops are reaped early in summer—and by enlarging the seeding, they may be increased to any desirable extent beyond their usual quantity, if required by the deficiency of the previous crop of corn. The value of this security against famine, is not the less a blessing, because we have not appreciated it, and have scarcely imagined the possibility of the occurrence of such miseries as often afflict other nations. * * * *

From the New England Farmer.

ATLANTIC SILK COMPANY.

Extract of a letter from Col. Gardener, of Nantucket.

We shall commence manufacturing silk goods in two or three weeks. We have one invoice of India and one of Naples silk on hand, and we are daily expecting an invoice from Smyrna, and have also sent orders for a large amount, which will arrive in the country in July, or the first of August next. We have had a piece of handkerchiefs sent us from the Spitalsfields weavers, and we trust before long to have the pleasure of exhibiting it in Boston with a piece of *Nantucket*, made from precisely the same stock. In the mean time individuals have commenced setting trees on their own account. I shall put on my farm this spring about eighteen thousand trees, including about twenty-five hundred of the Morus Multicaulis. My friend, S. B. Tuck, will set about as many more. We have no doubt at all of the success of the Morus Multicaulis, but we have found it impossible to procure them at any price. As many of our white mulberries are small, our present intention is to engraft them another year.

TO READERS AND CORRESPONDENTS.

Owing to a combination and succession of losses and mishaps in the printing department of our business, (a department of which we have been compelled, and with as much reluctance as unfitness, to assume the personal and immediate direction,) the May No. was not issued until the 12th, instead of the 1st of May; and to make up for the lost time, and to return to the usual and regular time of issue, it was necessary to print the present No. in half the usual time. This will, *in part*, serve to account for the circumstances that No. 1, which was six weeks in going through the press, was very largely supplied with original matter, and No. 2 has a supply unusually small. But it is *only in part*, that this explanation serves—for, in truth, the aid of our correspondents is furnished very irregularly; and it has so happened that there has been but little received within the last month. It is hoped that this cessation is but temporary—caused, probably, by the recent fine and growing weather, which has given to every farmer abundant and interesting employment in his fields; and that, from all such persons, the Farmers' Register will, at least, have the benefit of some of the leisure time afforded by rainy days in summer, and the long and tedious nights of winter. In the meantime, we are persuaded that the present offering of original matter will not be found deficient except in *quantity*—and the defect, in that respect, has permitted the insertion of some long and interesting selections, which, otherwise, would necessarily have been deferred, or excluded.

ERRATUM.

To the Editor of the Farmers' Register.

If I am not mistaken, you have omitted a part of my communication, which appears in the first number of Vol. IV of the Farmers' Register, viz. "I beg leave to bring before your readers, an old theory on the generation of plants," &c. The omission would induce the reader to believe the theory advanced to be one of my own, which is not the fact. The theory and opinions are drawn from Richard Bradley's old treatise on gardening, published more than a century past.

GALEN.

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PRICES CURRENT.

May 28,1836.

PRICES OF STOCKS.

	Par value.	Offered.	Asked.	Last sales.	Last dividend for 6 mos.
BANK—Virginia—per share,	100			118	4½
Farmers',	100			116	4
RAIL ROAD—Petersburg and Roanoke,	100	119		119¼	5
Portsmouth and Roanoke,	50				unfinished
Chesterfield, ($ of capital refunded,)	100			120	
Richmond & Fredericksburg,	100			108	unfinished
Greensville & Roanoke,	100	110		111½	do.
Raleigh and Gaston;	100			101½	do.
MANUFACTURING COMPANIES.					
Petersburg Cotton Manufactory,	100	120	121	119	6
Merchants' Do. old stock,	100	138		136	8
Do Do. new stock,	100	120			
Matoaca Do.	100	112½		113½	(new)
Richmond	100			100	
Manchester Do.	100			100	
Franklin (Paper Do.) Richmond,	100			95	
INSURANCE COMPANIES.					
Richmond Marine and Fire,	100			95	
Petersburg,	100	105		105½	new.
EXCHANGE on England,		8¼ per cent.			

COUNTRY PRODUCE

Corn per bushel,	80 cents.
Wheat,	None in market
Flour, superfine (country,)	$6.25 to 6.50
Cotton,	15½ to 17
Tobacco,	$4½ to 12
Bacon, (hog round) per lb.	13.

A FIRST RATE BOOK AND JOB PRINTER is wanted as Foreman and general conductor of the printing department of the Farmers' Register Office. To such a person, and one who also has the necessary qualifications of good habits, experience and sufficient education for such a charge, an excellent situation can be offered. Letters on this subject (post paid) may be addressed to

May 28. EDMUND RUFFIN, Petersburg, Va.

CLOVER SEED, WAGONS, PLOUGHS, GROCERIES, &c.—250 Bushels Sapling and Mountain Clover Seed. Timothy, Burnet, Orchard Grass and Herds Grass Seed. Very Superior one and two-Horse Northern Wagons; Ploughs from several of the most approved Factories. Sugar, Coffee, Molasses, Tea, Preserved Ginger, Candles, Paints and Oils, Lime, Tar, Salt, Iron of every description. 50 casks of Pure Wine; 1,500 Segars; Soal, Upper. and Harness Leather; Iron and Brass Bound Buckets and Tubs; 150 tons best French Plaster, (part in the rock) Cooking Stoves; Seine Twine; Blankets; Cassinetts;—And a general assortment of Crockery, Hardware and Cutlery, &c. &c.—Now receiving and for sale by

READ, WOMACK & CO.

Farmville, Nov. 1, 1835.—12*t*.

TO CORRESPONDENTS.

The following communications were received too late for this No.—"*On the action of gypsum as a manure*"—"*On the Railways of North Carolina,*—"*Observations on House-keeping.*" It is regretted that the publication of the account of the Echelon Cultivator and Expanding Harrow, has been delayed by the necessary engravings not having arrived in time.

☞ With this No. bills will be sent to every subscriber who is indebted for more than the current volume. For reasons that are sufficiently obvious, no exception will be made of any individual so indebted—nor will there be, when the same bills are hereafter placed in the hands of the collecting agent. Should any improper charge be made, the mistake will be acknowledged and corrected as soon as made known. No demand will be made on subscribers who owe *only* for the current volume.

☞ The privilege offered, in Article 7 of the Conditions of the Farmers' Register, to clubs of *old* subscribers to make united payments for the current vol. at a reduced price, expires, by its then limitation, with the issuing of this No. on June 1st. All other articles of course remain in force.

INLAND ROUTE

FOR NORTHERN AND SOUTHERN TRAVELLING.

THE RICHMOND, FREDERICKSBURG AND POTOMAC RAIL ROAD COMPANY,

In connection with the other Rail Road and Steamboat Companies on the route, have adopted the following Schedule, by which the daily mail is now carried.

(*NORTHWARD DIRECTION.*)

LEAVE			ARRIVE AT		
Blakely, N. C.	at	5 o'clock, P. M.	Petersburg,	at	10 o'clock, P. M.
Petersburg,	"	2 " A. M.	Richmond,	"	5½ " A. M.
Richmond,	"	6 " A. M.	Washington,	"	9 " P. M.
Washington,	"	2½ " A. M.	Baltimore,	"	5½ " A. M.
Baltimore,	"	6 " A. M.	New York,	"	11 " P. M.

(*SOUTHWARD DIRECTION.*)

LEAVE			ARRIVE AT		
New York,	at	4 o'clock, P. M.	Baltimore,	at	3 o'clock, P. M.
Baltimore,	"	5 " P. M.	Washington,	"	8 " P. M.
Washington,	"	3 " A. M.	Richmond,	"	6 " P. M.
Richmond,	"	7 " P. M.	Petersburg,	"	10½ " P. M.
Petersburg,	"	1½ " A. M.	Blakely,	"	7 " A. M.

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NORTHWARDS, 54 HOURS; SOUTHWARDS, 57 HOURS.

BETWEEN NEW ORLEANS AND NEW YORK,

NORTHWARDS, 12 DAYS AND 13 HOURS; SOUTHWARDS, 13 DAYS AND 8 HOURS.

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By arrangements which this Company is making, passengers, with their baggage, will be conveyed to and from the Depot without charge. On the Rail Road, a Coach will be especially appropriated to Northern and Southern Travellers; and, in general, the Company's Agents will adopt all measures calculated to expedite and facilitate their journey.

Carriages and Horses are safely and expeditiously transported; enabling those travelling in them, with the additional use of the Potomac Steamboat, and the Petersburg Rail Road, to accomplish, without fatigue to their horses, the journey between Washington and Blakely, N. C., in two days.

The Mail Train leaves Richmond at 6 o'clock, A. M.; returning, leaves the North Anna at 4 o'clock, P. M. The alternate trains for passengers and freight, leave the North Anna at half past 8 o'clock, A. M.; and Richmond at half past 1 o'clock, P. M.

All possible care will be taken of baggage, but it will be carried only at its owner's risk.

Rail Road Office, Richmond, May 14, 1836.—*tf.*

Oscar Nott

THE

FARMERS' REGISTER,

A MONTHY PUBLICATION,

Devoted to the improvement of the Practice,

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

VOL. IV. JULY, 1836. No. 3.

And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." *Swift.*

PETERSBURG, VA.
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1836.

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[*This publication consists of four sheets—postage for 100 miles or less, 6 cents—over 100 miles 10 cents.*]

LIST OF PAYMENTS FOR THE FARMERS' REGISTER, MADE BY SUBSCRIBERS, OR PURCHASERS, FROM MAY 29th, TO JUNE 29th, 1836.

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Seth Barton	New Orleans
Thomas Gadsden	Charleston, S. C.

PAYMENTS FOR VOL. II.

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James B. Urquhart	Southampton
Professor Gerard Troost	Nashville, Tenn.
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Josiah Collins	Edenton, N. C.
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Melancthan C. Read	do.
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John S. Barrett	King William
Josiah Collins	Edenton, N. C.
Wm. H. Southall	Halifax, co., N. C.
James H. Christian	Charles City, Va.
Wm. A. Selden	do.
Thomas Jones	King William
Henry Fitts	Warrenton, N. C.
James C. Bruce	Halifax, Va.
S. C. Corbell & J. H. Godwin	Nansemond
Peter Puryear	Mecklenburg, Va.
Alfred Billups	Mathews
Edmond Jones	do.
A. W. Nolting	Richmond
John M. Vaughan	Goochland
H. P. Poindexter	do.
John W. Custis	Accomac
S. V. Watkins	Mecklenburg
William Radford	Lynchburg
Robert Ritchie	Petersburg
A. W. Venable	Mecklenburg
James J. Hinton	Johnston, N C

PAYMENTS FOR VOL. IV.

George H. Walker	Philadelphia co., Pa.
Thomas Smith	Mathews, Va.
Wm. Woods	Albemarle
Isaac White	do.
Ro. H. Carter	do.
Joseph C. Cabell	Nelson
Joseph T. Granberry	Perquimans, N. C.
John H. Blount	do.
Richard J. Gregory	do.
John M. Skinner	Pasquotank
Edmund Blount	do.
John Ruff	Rockbridge, Va.
Wyndham Robertson	Bichmond
Wm. B. Dabney	do.
Wm. P. Strother	do.
Edmund P. Barbour	Orange
Miles C, Selden	Henrico
Thomas H. Landsell	Northumberland
James B. Urquhart	Southampton
Warner T. Taliaferro	Gloucester
Colin Clarke	do.
William Smart	do.
Gerard Troost	Nashville, Tenn.
John B. Gray	Stafford, Va.
Bernard Peyton	Richmond
Carter H. Harrison	Albemarle
Wm. E. Beckwith	Fairfax
James Norcum	Edenton, N. C.
John P. Willcox	Petersburg, Va.
David May	do.
Thomas Atkinson	Dinwiddie
Thomas Whitworth	do.
Wm. Robertson	Petersburg
Harris S. Evans	Wilcox, Ala.
George Douglas	Goshen Hill P O., S. C
Oliver H. Prince	Athens, Ga.
S. D. Morton	Petersburg, Va.
John H. Cocke, sen.	Fluvanna
John H. Cocke, jr	do.
James D, Wood	Prince Edward
Anderson C. Morton	Charlotte
Patrick Noble	Abbeville, S. C.
William Bowie	do.
Jabez Smith	Petersburg
Benj. F. Taylor	Columbia, S. C.
James Jones	Buckingham C H, Va
Th. J. Randolph	Albemarle
Samuel L. Price	Bedford
James Lindsay	Albemarle
Philip Rainey	Mecklenburg
Charles Carroll	Anne Arundel, Md.
Wm. F. Brockenbrough	Richmond co., Va
Burwell Boykin	Camden, S C
Wm. C. Fitzhugh	Fauquier, Va
James H. Britton	Culpeper, Va.
Elijah Fletcher	Lynchburg
J. N. McPherson	Camden, S C
George W. Read	Charlotte
Melancthan C. Read	do.
J. Watkins	Powhatan
Gooch & Omohundro	Fluvanna

THE FARMERS' REGISTER.

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EDMUND RUFFIN, EDITOR AND PROPRIETOR.

ON THE ACTION OF GYPSUM AS MANURE.

Big Lick, Botetourt,
May 22d., 1836.

To the Editor of the Farmers' Register.

An intelligent contributor to your first number of the present volume, deduces from his experience in the cultivation of clover, with the aid of plaster, that they are insufficient for the restoration or improvement of worn out lands. From his experiment, it appeared, that through the agency of clover and plaster, the productiveness of his land was materially increased for a few years; but that after the second year, his crops began to deteriorate so much as to induce him to abandon the clover system, and rely upon marsh mud and putrescent manures. This statement of facts is so much at war with the generally received opinion of the effects of clover and gypsum, and so opposed to what I had before considered the well-established theory of plaster, that I felt some curiosity to see how they could be reconciled. The mystery which has heretofore veiled the character of this mineral, when considered as a manure, has been measurably drawn aside by the scientific researches and practical labors of Count Chaptal. Before his genius and erudition and sound judgment were devoted to agriculture, and excited to the most energetic action by a passionate love for the study, the whole world, learned and unlearned, were entirely ignorant of its *modus operandi.* Some urging, what the experiment of your contributor would seem to prove, that plaster was a powerful stimulant, which excited the land to unnatural production, and having wasted its fertility in a few years, would leave it altogether inert and barren. Others laid great stress on its being an absorbent of moisture, and confined its benefits to periods of drought: whilst others, guided by the feeble lights which science had shed upon the subject, embraced the opinion, that, although its stimulating and absorbent qualities were entitled to some consideration, yet, that its great value consisted in its being soluble, and acting directly as a *pabulum* to the crop. Among those who adopted this theory, and whose reputation gave it the stamp of currency, was Sir Humphry Davy, a philosopher upon whom nature had scattered the rays of genius, and the inspiration of intellect, with a bountiful hand—one whose efforts to improve the science of agriculture, as connected with chemistry, entitles him to our highest admiration and lasting gratitude—and one who, had he been so situated as to have brought his theories to the touchstone of experience, would have shed a flood of light upon the path of the husbandman, which would have cheered him through many a dreary *jungle* of contradictions and difficulties, which perplex and annoy him. From an analysis of the soil in those districts of England, in which plaster is inoperative, he ascertained that they contained a much larger proportion of gypsum than the soil of those where it was beneficially employed. He, likewise, ascertained, from a series of the most carefully conducted experiments, that those plants, upon which the effects of plaster were most striking, contained it in the largest quantities. From which two facts, taken in connection, he inferred that gypsum was an essential constituent in the organization of those vegetables upon which its influence is most discernible; that it was a species of food which was all important to them; that some soils were surcharged with it, and others deficient; that of course in the one case it would be waste to apply it, and in the other, an indispensable auxiliary. Such being the theory of this great man, the whole world seemed to acquiesce in its correctness, until Count Chaptal, profiting by the researches of Sir Humphry, and possessing the incalculable advantage of experience as a practical agriculturist, gave to the world the fruits of a life time spent in the ardent pursuit and patient investigation of agriculture, as a science.

Looking upon his vocation, not only as the most important, but as the most dignified and independent and honorable of all others, and as requiring the exercise of the highest faculties of the human mind, he prosecuted it with a zeal and energy that never wavered; and in the maturity of age and experience, presented the public with a work entitled *Chemistry applied to Agriculture*—a work in which the perspicuity of his mind, and the solidity of his judgment are every where conspicuous—a work in which he seems to thread the intricacies of the science with intuitive sagacity, and to illumine its paths with a torch, which renders them plain and easily travelled by all. In that portion of his book which treats of stimulating manures, he bears testimony to the immeasurable utility and extraordinary efficacy of plaster. He unites with Davy in discarding the idea of its value consisting in its attraction for moisture, for the very plain reason that it solidifies what it absorbs, and of course does not impart it to the plant. He also concurs in the correctness of Davy's experiments, which proved that it was not favorable to decomposition. He attaches no importance to it as a *pabulum*, and thinks that its great virtue resides in its stimulating properties. The fact that it requires 500 parts of water to dissolve one of plaster, thus affording a moderate, constant, and uniform stimulus to vegetation, he considers its most valuable feature. These opinions he deduces from numerous well established analogies, and which, to those who read his work, will seem to follow naturally and inevitably. If, then, Chaptal be not mistaken, your correspondent has certainly erred in inferring from his experiment, that plaster was a mere alterative or stimulant, whose effects weakened the productive powers of his soil after a few years. If he means further to convey the idea that though the land continued to produce clover luxuriantly by the aid of plaster, that the soil was not improved, and the wheat and corn crops deteriorated annually, I must insist that he has mistaken the cause, though I am unable to suggest the true one, without a more intimate knowledge of his system of farming. According to Chaptal, gypsum acts only as a condiment—a spice to excite the digestive organs of the plant; and clover and corn being among those plants upon which it acts most powerfully, its effects upon the after production of both, should have corresponded. If, moreover, the effect of the stimulus be to make the crop more luxuriant, and thus draw more heavily upon the nutritive principles of the soil, then your correspondent using clover as an alternating crop, would return to the soil an immense addition of vegetable matter—which has been shown, under the four shift system of Shirley, and Westover, under the five, and six, and seven shift systems of Messrs. Craven and Rogers, of Albemarle, and under the infinite variety of systems in which plaster and clover are used in rotation, throughout Pennsylvania, Jersey, New York, along the broad belt of red land at the base of the Blue Ridge, and the coterminous calcareous region of the Valley of Virginia—to be attended with progressive and permanent improvement.

I have amplified, I fear tediously, upon this subject, because I consider the doctrine advanced by your Maryland correspondent, the most dangerous which could gain ground among the desert wastes, which disfigure Eastern Virginia. And because it has already gained foothold with other gentlemen, who, like your intelligent correspondent, have yielded at the first failure, and abandoned, what I am sure, has done more to repair the ravages—the murderous cut-throat system of our fathers—than all other agents united.

Your Charlotte correspondent, J. F. E., tested by the same authorities, would be adjudged equally exceptionable upon this point; and from the sound sense which his remarks respecting putrescent manures indicate, he will probably have as many converts as your Maryland correspondent. If these gentlemen have not read Chaptal's book, I will take the liberty of recommending it to their perusal, in the confidence, that I offer them a rich banquet, where they may regale themselves with pleasure and profit, and in the further confidence, that they will rise from its perusal, advocates of gypsum and clover, and even more zealous than they are now, for putrescent manures. They will think, with the learned Frenchman, "that the use of plaster is one of the most important improvements that has ever been made in agriculture"—"that dunghills are the riches of the fields;" for, "without dung, there is no harvest."

WM. M. PEYTON.

P. S. Chaptal states, in his treatise near the bottom of page 75, that 300 parts of water will dissolve one of gypsum. This differs so materially from Sir Humphry Davy, and other chemists, that I have been induced to suspect that it was an error of the printer; but there being no other passage in the work by which it can be tested, and there being no other copy in the neighborhood, I must beg the favor of you to compare it with yours, and inform me whether they correspond.*

In publishing some hasty remarks, appended to a letter of business, which I addressed you last month, (your polite answer to which, I received as I commenced this sentence,) you committed several typographical blunders, such as "greatly undilating for "gently undulating"—"immediately" for "irremediably," &c., all of which, I have no doubt, are justly chargeable to the indistinctness of my hand writing.

W. M. P.

From the British Farmer's Magazine.

SPADE HUSBANDRY.

Sir,

I beg leave to call the attention of your readers to a recent experiment of spade husbandry in the neighborhood of Eastbourne, which fully proved that digging land is cheaper than ploughing it. Ten surplus laborers petitioned to dig a quantity of land "*at twenty shillings per acre, which is fully equal to three times ploughing, which costs thirty shillings per acre.*" Some of the respectable agriculturists of that neighborhood have made the experiment, and it has also been practiced in Scotland: it will not, therefore, be unreasonable to hope, that, if it be so much cheaper than ploughing, and advantageous in other ways, the practice may become general.

It is admitted by those conversant with the farming business, that it never was in a more depressed state than it is at present; and, consequently, that it needs the utmost economy in expenditure, the most judicious application of labor and skill, and, indeed, every other aid which can be called to its support. It is on this account that I would urge the necessity of every farmer making a trial of the spade, in place of the plough. The experiment is simple, requires no additional study to comprehend it, and its rusults are certain. They may do this without the trouble of analyzing soils, or burdening their memories with a knowledge of chemistry, or laying out large sums in certain profitless pursuits: in fact, by such a course, they may cultivate their farms at a less expense, augment their profits, and improve the condition of their laborers.

If digging were extensively practised, it would furnish employment for thousands of men, able and willing to work, who are now unemployed; and much of that degradation and crime, the concomitants of idleness, which has been manifested amongst the agricultural laborers, would thereby be curtailed. It is often the case, too, that the farmer is the sufferer by such crime; for, though he may feel sorry for the wretched men, yet he has not always the means of relief in his power; nor, from the places in which his produce is deposited, is he able to protect it from those who may wish to appropriate it to their own uses. Misfortune often compels men to do what they would shudder at the thought of in opposite circumstances, and it is said that "hunger will break through stone walls;" therefore, they may be tempted to plunder the potato-hog or the barn, to obtain a meal for their starving families; poaching necessarily accompanies such condition; one crime is followed by others of greater magnitude; they thus become amenable to the law; are prosecuted; and their families have to be maintained —still out of the farmer's means. In such a state of things, if any plan can be found which will benefit both the farmer and his servant, it ought to be adopted. Spade husbandry has been tried, and it is asserted that by it the working of the land is better performed, and is much cheaper, than when done by the plough: the farmer could thus give employment to many deserving honest men, and afford them means to rear their families in a comfortable manner. It is, therefore, desirable, that every well meaning man should give his attention to the subject, and endeavor to promote its extension, thus holding out a "helping hand" to those who so much need it. T. C.

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* The figures above referred to are correctly given in our correspondent's copy, (the American translation,) as we have ascertained by examination of the orginal work, (Paris edition.) Chemists differ greatly in their reports of the degree of solubility of gypsum in water.—Ed. Far. Reg.

From the Genesee Farmer.

ORCHARD GRASS.

Next to the clovers, red and white, herds grass and timothy, the grass that appears best to repay cultivation in the northern states, is the orchard grass of the north, or cocksfoot grass, as it is sometimes called in the middle states. Its valuable qualities consist in its early growth, the rapidity with which it springs up when fed or cut down, the quantity it produces on light soils, and the covering it affords soils which are apt to suffer after mowing from exposure to the sun. When allowed to become old and dry, it does not appear to make as good hay, or be as palatable to horses or other stock, as the first mentioned grasses; indeed, to derive the full benefit of orchard grass, frequent mowing, or constant cropping, is requisite. For a second mowing, or crop of rowen, the orchard grass is unequalled.

Orchard grass is excellent for sowing with clover on all soils, but especially on dry ones, as when mown with the other it springs up so rapidly as to preserve the clover roots from drying up, as they frequently do, and thus prevents the retardation in growth, or death of the plants, that so often ensues. Judge Peters of Pennsylvania, one of the first agriculturists in this country, says, "that on uplands it is preferable to timothy, and that when sown with clover, it endures in uninterrupted vigor and usefulness, when the latter in dry seasons is burned or shriveled." W. H. Johnson, of the same state, and a practical farmer, says—"*As a pasture grass it is without a rival.*" Unlike timothy, or herds, or clover, when cut, its growth is one continued effort of vegetation. The new shoot springs immediately out of the blade, and with such a rapidity that I have known in a rich soil, during eleven or twelve days, an average growth of more than an inch per day. Of all the grasses with which I am acquainted, it is the first to grow in the spring, and continues to flourish the last in the fall. It is soft, sweet and nutritious, and when growing with other grasses, it is observed that stock most generally give it a decided preference.

We have for a number of years been in the habit of cultivating this grass, and can cheerfully add our testimony to the above statement of its good qualities, and would further add, that, as its name imports, it is superior to any other grass for orchards, groves, or fields containing great numbers of shade trees, as under such it flourishes nearly as well as in the open air. The only serious objections we have ever known made to its use were, that by being sown with or without clover, it would form an obstacle to the usual rotation of crops adopted in our wheat growing sections, and that when sown on our lands, it too frequently grew in tufts, rather than in a thick close sward. That it can ever be profitably introduced on lands on which it is intended to raise a crop of wheat as often as once in three years, we do not imagine; in such cases, clover, and nothing but clover, should be used, as on this the fertilizing powers of manure and plaster can be most profitably exerted. But there is on almost every farm, fields that cannot and ought not to be subjected to the rotation system, and here the orchard grass may be invaluable. On farms, too, intended for grazing, the orchard grass will prove a most important auxiliary and one which we think will be more valued and appreciated the more it is used and cultivated. The rapidity with which it throws out new leaves after cutting, is almost incredible, and should be witnessed by all who would understand the vegetative powers of plants. As to its growing in tufts—this is true, as it is generally sown, but the difficulty, we think, lies in not having a sufficient quantity of seed put on an acre. If put on thick enough, it grows no more in tufts than the other grasses, and spreads in the same manner. When thinly sown with timothy or clover, it grows so much more rapidly after cutting than the others, that a field necessarily assumes a tufted appearance; but this produces no injury whatever, and is indeed beneficial to the grasses with which it is associated.

Orchard grass seed should be cut rather early, and carefully dried, as otherwise it is apt to fall out and be lost. Where it is intended to be mown, the seed when ripe may be cut clean with a cradle, and thus secured, and the bottom then cut with a scythe, as usually performed. The seed is quite light, not often weighing more than 14 or 15 pounds to the bushel; and should be sown in still weather, that the action of the winds in unequally scattering it, may be prevented. It has been ascertained that for seed lots, two bushels should be sowed to the acre; and for the scythe or for pasture, the mixture should be one bushel of orchard grass and one of timothy seed, sown either in the spring or fall, and over which should be scattered four quarts of clover seed in the month of March. G.

TO PREVENT TIMBER FROM ROTTING.

[We have published before an account of this important discovery of Mr. Kyan's, but this is a later and, in some respects, a more explanatory statement.—ED. FAR. REG.]

From the New Bedford Mercury.

Mr. Lindsey:—If you think the following description of the method of preserving timber from rot, insects and worms, now universally adopted in England, is of importance to the public, you will confer a favor by giving it an insertion.

The writer of this is personally acquainted with the ingenious inventor—has attended the lectures in London on the subject, and is satisfied of the efficacy of his plan.

The material employed by the inventor is corrosive sublimate, long known as a great preservative of animal substances from decay. The timber to be prepared must be placed in a tank or vessel, from 40 to 80 feet long, 4 or 5 feet deep, and about the same width. A solution of the corrosive sublimate is then thrown upon it until covered; the proportion, according to the inventor, is 1 lb. of corrosive sublimate to 5 gallons of water—but individuals who have tried it, say 1 lb. to 10 gallons of water. Pine plank are saturated in 48 hours. An oak stick, 40 feet long and 1 foot square, requires three weeks—during which time it becomes effectually seasoned, and will not contract or shrink, even on exposure to the highest temperature of a tropical climate. The corrosive sublimate has a strong affinity for the albumen or vegetable juices generally called sap, combines instantaneously with it, and forms a new chemical compound which is solid, insoluble, and will not attract moisture. The efficacy of this invention has been tested in the most extraordinary manner. Pieces of the timber prepared with a solution of the sublimate, and unprepared pieces, the latter well seasoned, were placed in the "*Rotten Pit,*" at the King's Dock Yark, Woolwich, in 1828. In 1831, the writer of this was present when they were withdrawn. The prepared timber was perfectly sound—the unprepared, although of the best English oak, was a mass of rot and decayed vegetable matter.

The prepared sticks were left on the ground in the open air six months, and then again placed in the Rotten Pit, with other pieces of well seasoned timber. At the end of two years, the prepared timber was found quite sound—the seasoned very rotten.

The Rotten Pit, at Woolwich Yard, is a cave under ground, 80 feet long by 20 feet, and built by order of government, for the purpose of testing the efficacy of the various proposed nostrums for preserving timber. The pit is lined, top, bottom and sides, with vegetable matter in the worst possible stage of corruption—very damp and full of carbonic acid gas—it is a perfect hot-bed—a candle will not burn it in a minute, so foul is the air of this subterraneous chamber. In fact, no timber, although thoroughly salted, docked, or seasoned, will resist three months the powerful decomposing qualities of the Rotten Pit. The specimens were placed on the bottom of the pit, and half buried in the putrid vegetable matter with which the cave is kept supplied. This experiment seemed so conclusive, that Government immediately paid the inventor £10,000, and advised him to take out a patent. He was ordered to construct tanks at all the Dock Yards, and the government timber was immediately prepared in the above manner. Previous to this, individuals had fitted tanks, and two whalemen were built entirely of timber and plank prepared with the solution. House builders are also using it very generally in London. The sleepers, or foundations for railways—staves for oil casks, canvass, rope, and all vegetable matter, may be preserved by its use. It is found that a cubic foot of oak, will absorb three pints of the liquid, which will cost at the present price of quicksilver, 7¼ cents per cubic foot; a mere trifle compared with the immense advantage of having a material not liable to be destroyed by rot, worms, or insects of any kind. The objection urged against this material, is its poisonous nature. But it has been proved, by careful experiment, that corrosive sublimate, when it combines with the sap of wood, forms a compound perfectly insoluble, and quite innocent—in fact, a complete chemical change takes place in the poisonous nature of the mixture by this combination.

The writer has seen experiments tried upon canvass and rope, which were immersed in the solution, and placed four months in a dunghill: the unprepared pieces were destroyed—while the texture of the prepared specimens was not weakened in the slightest degree. Any one can try this by using the above proportions.

Satisfactory accounts have been received by Messrs. B. Rotch and M. Enderby, of London, from the captains of the whale ships constructed at their instance, of timber prepared as above—testifying that the crew were remarkably healthy, although they slept actually in contact with the ceiling plank thus prepared, through all climates and changes of temperature.

It is well known to practical men that salt is not an effectual preservative—as many ships, salted on the stocks, have been found rotten the first voyage—one instance, the Enterprise of Nantucket. The Golconda, of New-Bedford, has had a new windlass three voyages in succession, and the lower masts of ships very quickly decay. These parts of a ship it is impossible to salt. In the British navy, the use of salt has been discontinued, as it is found to corrode the iron rapidly, and it also keeps a ship in a very damp state.

From the Cultivator.

PRESERVING BUTTER.

Believing that butter may be kept sweet and good in our climate, almost any length of time, if properly manfactured, and well taken care of, in order to test the validity of this opinion, we had two pots put down, in June, and the other in August, 1834, more than twenty months ago; and on probing them with a tryer, while penning this article, the butter is found perfectly sweet, and seems to retain most of its original flavor and freshness. We design to send both pots to Boston next fall, with a view of having its mode of manufacture, and method of preservation, judged of by the butter tasters of that notable city.

In the manufacturing process, *no water is permitted to come in contact with the cream or butter*—because it is believed that water, and particularly soft water, dissipates much of the fine flavor that gives to butter its high value. The Orange county dairy women say, "give us good hard water, and we will make good butter"—for the reason, probably, that it abstracts less of the aroma from the butter than soft water. The temperature of the cream may be regulated by cold or hot water put into a tub, in which the churn may be plunged. If the cream is clean. it needs no washing; and if the butter is dirty, water will never clean it.

Nothing but good well pulverized salt is used in preserving the butter; this is *all* mixed, and *all* dissolved, in the mass, before the butter has its second, thorough and final working with the butter ladle, and which is not finished till *all* the buttermilk is expelled.

To avoid all taint from the butter vessels, and the better to exclude it from the air, which soon injures it, the butter is packed close in clean stone jars, and when nearly filled, is covered with a strong brine, rendered pure by previous boiling, skimming and settling. In twenty months this brine has been twice renewed, on the appearance of a film upon the surface of the old pickle. To preserve butter, air and water, and heat above 65 or 70 degrees, are to be guarded against as much as possible. The brine upon the surface does not penetrate the mass, nor while sweet taint it; but it thoroughly excludes the air.

From the New England Farmer.

DEMAND FOR COCOONS.

If farmers have any doubts remaining with respect to the demand for cocoons, or raw silk, they will be removed on seeing markets opening for them in all directions. The manufacturing companies already formed, will require more of the raw material than will be grown in this country for the next quarter of a century. Many of these companies are incorporated for the purpose of growing, as well as manufacturing silk; on account of the necessity which they will be under for years to come, of producing their own stock. This union of both branches of the business is not a matter of choice, but of necessity. The manufacture of silk is a distinct branch of business from its culture, and it would be desirable to keep it so, were it practicable; but until farmers engage in the business with spirit and activity, manufactures must rely on their own resources to furnish their own stock.

From the New England Farmer.

TRANSPLANTING EVERGREENS.

It is generally recommended in transplanting evergreen shrubs and trees, to do it in winter, or when a large frozen ball of earth can be removed with the roots, which prevents any exposure of them to the air, and the necessity of applying new earth to them. But it frequently happens, that circumstances render this method very inconvenient, or impossible. When this is the case, they should be transplanted considerably later in the spring than common deciduous trees. The best time is when the buds are beginning to swell, or when they are passing from a quiescent state to that of active vegetation, as it is then that they are best prepared to supply, by new roots, any loss sustained in their removal.

From the Genesee Farmer.

SPREADING STABLE MANURE.

"I cannot subscribe to the doctrine of hauling out stable manure, and leaving it in heaps until we are ready to plough it under. It will ferment. The sooner it is spread after being disturbed, the better; and from often repeated experiments, my best crops have uniformly been where the dung was spread as fast as it was hauled, though it lay exposed to both sun and rain for some days,—in a few instances for several weeks before it was ploughed under. The same kind of manure which lay in heaps unspread till the day it was ploughed under, produced a very inferior crop. I have not been able to discover that manure when spread abroad ready for the plough, sustains any great loss from evaporation—or at least not so much as from fermentation while lying in heaps after it has been disturbed; for dung undergoes a fresh fermetation every time it is moved and then left in bulk: if it lies spread evenly over the surface however, its strength is carried into the soil by the rains."

The above suggestions appear reasonable; and whether the experience of others will accord with these results or not, we think his suggestions are worthy of careful examination. The experiments can be easily repeated; and we hope that farmers will not prejudge the case, but patiently examine for themselves. Well directed attention to matters, often deemed trivial, like the diligent hand maketh rich.

From the Genesee Farmer.

TWO CROPS AT ONCE ON THE GROUND.

Three years ago, I was persuaded to plant potatoes between the rows of Indian corn. The field had been well dressed with both lime and stable manure, and the ground well cultivated: yet the result was less than half a crop of either corn or potatoes; and my maxim has since been *one crop at a time.* It is all that we can reasonably look for; and so far as my knowledge has extended, every attempt at *double cropping* has ended in disappointment.

THE CONNECTICUT SILK FACTORY.

[So great is the interest at the present time to our country in the culture and manufacture of silk, that almost any thing relating to the subject is sure to attract attention. We doubt not therefore that the following Report will be highly acceptable to our readers. It will be gratifying to the public to learn, that the encouragement afforded by the legislature to this important department of industry, has been attended with such beneficial results; and to our citizens especially it must be a source of pride and satisfaction, that so useful and well regulated an establishment as that described in the report, is located in our city.]—*Con. Courrant.*

The Committee appointed by the "*Hartford County Silk Society,*" to examine into the present condition and progress of "the Connecticut Silk Manufacturing Company," have attended to the duty of said appointment, and submit the following report.

On going into the establishment of said company, the Committee could not avoid expressing their satisfaction at the good order, neatness, and comfort, which every where appeared among its inmates. The weaving room contains about 100 looms, about 60 of which were occupied by neat, industrious looking young ladies, apparently from 12 to 20 years of age, and while their labor, that of weaving a fabric from two to four inches wide, appeared exceedingly light and pleasant, there was a general contentment and satisfaction exhibited in their countenances, or by the singing of some sprightly air.

The charter of the silk company provides that the said company shall instruct one person to be named by each of the county silk societies, in the art and mystery of reeling silk, without expense. But the Committee learned, with great satisfaction, that the President of the Manufacturing Company, Mr. Colt, the present director of the establishment, is willing to instruct every one who offers, not only gratuitously, but will pay them a reasonable compensation for their services, to the number of two hundred, at least. It is understood that all applicants shall bring evidence of fair moral character, and that their ages shall not be under 15, nor over 40 years.

As the process of reeling the silk from the cocoons is performed only during the summer, those who apply for instruction in this part of the manufacture only, must of course come at that season of the year. But those who remain through the winter will also be instructed in the art of weaving Tuscan straw, and a variety of other fancy articles.

With respect to the time and labor required to learn the various arts carried on in the establishment, the Committee saw two young ladies who had been only a day or two at work, and were surprised at the facility with which they produced the finest fabrics.

The prices paid per yard for the fabrics, depend upon the ease, or difficulty, with which they are produced, so that with equal industry there is but little difference in their earnings. On inspecting the day book, the Committee found that 50 cents per day is nearly the average sum paid those who had been in the factory for a few weeks.

It is the wish and desire of the Silk Company that the farmers should raise the silk, their daughters reel it, and sell it in the raw state to the manufacturer. After the art of reeling has been acquired, the Committee see no difficulty in this arrangement, since the reel is a very simple and cheap instrument, and may be had of the company at five dollars each, and requires no more room or skill to keep it in order than the common household reel, so universally in use.

The Committee would therefore recommend that every farmer who raises only a few bushels of cocoons should have them reeled in his own house. This will be found by far the most profitable method, since the difference of price between the cocoons and the reeled silk will much more than pay for the reeling. This difference is so considerable, that even when the farmer raises only a few pounds of silk, the expenses of a reel would every year be saved by having the reeling done in his family.

The chief business of the Silk Company at the present time is the manufacture of Tuscan straw into fabrics for hats and bonnets; and the Committee were particularly interested in some estimates which the president of the company had made on this manufacture in a national point of view. If we suppose there are three millions of females in the United States, who purchase each a Tuscan hat annually, at the price of two dollars, then the cost of this single article to the country will amount to 6 millions per year. Taking the last three or four years as examples, it is thought that this estimate is not far from the truth, for it is known that there are upwards of 6 millions of females in our country, and we think that common observation is sufficient to show, that, in the Atlantic States at least, one-half of them have worn Tuscan hats within the last year or two; and judging from the known contagious nature of female fashions, we may fairly conclude that a similar estimate may be made with respect to the interior states. But since it takes two or three years for a fashion to pass from one end of our country to the other, it may be objected that our estimate is too high, as not all the females who wear Tuscan hats purchase them in the same year. But it must be remembered that two dollars is probably behind the average price of the article in question, and that the more common price has been from five to ten dollars. It must also be remembered that our estimate with respect to the number of females who wear Tuscan hats is probably much below the truth, so that we believe our estimate cannot be far out of the way.

Now taking for data certain facts presented by the Silk Company, the Committee are warranted in believing that the three millions of dollars, expended for the article in question, may all be earned by the females in this country.

In behalf of the Committee,

J. L. COMSTOCK.

EXPLANATORY REMARKS ON THE ACTION OF CHEMISTRY ON AGRICULTURE.

By James Renwick, LL. D. Professor of Nat. Exp. Philosophy and Chemistry in Columbia College, N. Y.

[A public-spirited agriculturist, in the western part of the State of New York, who is ready to devote a portion of his wealth, as well as the energies of his mind for his country's improvement, some months ago asked our leave to have re-published, for distribution in New York, the translation of Puvis' *Essay on the use of Lime as Manure*, which was prepared for, and first appeared in this journal. Of course, the permission was most readily accorded. Professor Renwick consented to carry the plan into effect: and this second edition of the translation has recently been published in a neat octavo pamphlet, and is preceded by the introduction, which will be inserted below. This piece is especially valuable as applying chemical science to agriculture, in popular and perspicuous language, according to its author's design, and suitable to the object of the publication, and the class of readers it was particularly intended to benefit; a most desirable and important matter, which is too generally neglected, if not contemned, by other men of science. But though a proper "introduction" to the work of Puvis, this is also a distinct, substantive essay, entirely fit to be presented alone, as it will be given here, and to furnish instruction to all who need it, on the elements of agricultural chemistry.]

The chemical facts and principles which are applicable to agriculture are neither numerous nor complex. They are, however, to be found only in works on general chemistry, in which they are intimately associated with laws and phenomena of a more abstruse description, and in connexion with which they constitute a science of which the most learned are still students, and to attain which in its existing form, may require years of close and attentive study. The language, too, of chemistry, which, to those who study it in a regular course, serves as an artificial memory, and single words of which call up long trains of thought and experiment, presents to the uninitiated all the difficulties of a foreign tongue.

Yet it cannot be doubted, that the practical farmer may derive important benefit from acquiring so much of this language, as will enable him to understand the chemical explanation of the numerous changes which are continually taking place in the natural actions which it is his high privilege to call into his service, to direct in part, and modify in degree. So also are there certain chemical elements and compounds, with the properties of which he ought to be acquainted if he wish to be able to direct his practical skill with more effect, even in circumstances familiar to him, but which may be absolutely necessary, or will at any rate save waste of labor and loss of time, when the knowledge acquired by practice, in one place, is to be employed in a new situation, and under a change of circumstances.

It is the object of this introduction to exhibit, in such form as may be intelligible to those who have not made general chemistry an object of study, a concise view of such of the laws and facts of that science, as are absolutely necessary for the agriculturist who may wish to improve his practice, and which are more particularly required by those who wish to avail themselves of the knowledge contained in the subjoined essay. To do this has been found no easy task. It would be in itself difficult, but to the author of this introduction has been more particularly so, as he has for years been in the habit of imparting instruction to those whose habits of life and thoughts are as remote as possible from those of the practical farmer; persons to whom the particular language of chemistry is an aid, instead of an impediment; and who, with ample time at their command, have an opportunity of pursuing the study of the science, step by step. Fully aware of these difficulties, both general and peculiar, this attempt would not have been made, and certainly not persisted in, had it not have been for the instances of an intelligent, scientific, and successful farmer, who has urged the completion of the task as an object likely to be beneficial to those, who, with perhaps equal zeal and native powers of mind, have not enjoyed, like himself, the advantages of a scientific education.

The atmosphere which surrounds our earth is the first object to which our attention should be directed. This is the vehicle of the moisture, which, whether it fall in the form of rain or dew, run in streams, or issue from springs, is absolutely essential to the success of the farmer's labor. It is also, as we shall presently see, important to him on other accounts.

The greater part of the atmosphere is made up of a mixture of substances, each of which has the same mechanical properties as the whole mass. These air-like substances are known to chemists by the name of *gases*.

Of these gases, two make up by far the greater portion of atmospheric air, and exist in it in the proportion of about four to one. That which is the largest in quantity, and makes up nearly four-fifths of the whole atmosphere, is called in the Essay of M. Puvis, by the name of Azot, but is more usually known in English by the name of nitrogen.

This substance, although in the largest proportion, is the least important of the gases in its chemical effects. It does not aid in supporting the life of animals, nor in maintaining the burning *(combustion)* of inflammable bodies.

The part of the atmosphere which is absolutely necessary for these purposes, is called by the name of *oxygen*, and nearly makes up the remaining fifth part of the atmospheric air. In its support of life, it always, and in maintaining combustion often, unites with a chemical element, which is called *carbon*. This is familiarly known as forming the principal part of charcoal. In its union with carbon, oxygen forms a peculiar gas known by the name of carbonic acid.

Carbonic acid is always found in small quantities in the atmosphere, to which it is furnished by the breath of animals and the fumes of burning bodies. It is, when in considerable quantities, fatal to the life of animals, but is prevented from accumulating to an injurious extent, in consequence of its being taken up by water; it is therefore dissolved, in proportions about equal to those in which it is formed, by rivers, lakes, the ocean, and the moisture of the soil.

Water exists in the atmosphere in the form of vapor. The great source of this vapor is the extended surface of the ocean; and it is governed by a mechanical law, by which it is continually tending to distribute itself uniformly over the whole surface of the earth. It may thus exist in as large quantities over the surface of the dryest land as over that of the ocean itself. This tendency to equal distribution is continually counteracted by the changes in the sensible heat *(temperature)* of the atmosphere, and of the surface of the earth, which follow the alternations of day and night, and the vicissitudes of the seasons. By these alternations and changes, the vapor is caused to fall *(precipitated)* in the form of rain, snow, hail, dew, or white frost, according to circumstances. As such changes of temperature are more frequent on the land than on the ocean, the water which falls on the former, in either of these forms, is greater in quantity than that which falls on equal surfaces of the latter. Thus, by a wise and benevolent provision of Providence, the water of the ocean is continually furnishing vapor, which is precipitated on the land for the support of vegetation and the supply of springs, and whose excess is poured back into the ocean in streams and rivers.

Water has been found by chemists to be a compound substance, made up of two elements. One of these, which forms eight-ninths of its weight, is the gas already mentioned under the name of oxygen; the other, a peculiar gas, known by the name of *hydrogen*.

Hydrogen, when free, is the lightest of all known bodies, rising and floating in atmospheric air; it not only combines with oxygen, to form water; but with carbon to form a great variety of compounds—gaseous, liquid, viscid, and solid. It also combines with nitrogen, and forms a gas known by the name of ammonia, which is well known by the peculiar smell it gives to spirits of hartshorn *(liquid ammonia.)*

Hydrogen also combines with sulphur, forming a gas known by the name of sulphuretted hydrogen; this exists in the atmosphere, but in such small quantities as only to be detected by the nicest chemical tests. It combines in like manner with phosphorus, forming phosphoretted hydrogen gas, whose presence in the air is occasionally perceptible.

Oxygen, as we have seen, unites with carbon to form a gas which we have called carbonic acid.

This receives the latter part of its name from its similarity in properties to an extensive class of compound bodies, known by the name of *The Acids*. The greater part of these, like carbonic acid, are combinations of inflammable bodies with oxygen. The most important of these, in reference to our present object, are the sulphuric and phosphoric acids; named from the two substances (sulphur and phosphorus) which are their bases. Muriatic acid may also be mentioned here, although its composition is of a different character. Oxygen unites with other bodies to form a class of compounds known under the name of oxides.

The acids unite with earths, alkalis, and metallic oxides, to form a class of compounds known under the general name of salts. These are named from the two substances which enter into their composition: thus, the salt formed of sulphuric acid and the earth lime, is called sulphate of lime. The substances which unite with acids to form salts, are called the *bases* of the respective salts.

Of these bases, the alkalis and earths are the most important. Of the alkalis, it is only necessary to know the names of two, namely *potassa* and *soda*, and to be aware that their distinctive properties, are—to possess an acrid taste, a caustic operation, to render oils capable of mixing with water, and to neutralize the properties of acids.

The earth which chemists call by the name of silex or *silica*, is found almost pure in flint and rock crystal; it is also almost pure in sharp colorless sands, and is by far the larger part of sands of every description. So far as the farmer need know its properties, it is hard, rough to the touch, has no attraction for water, which it permits to filter through, or evaporate from it, with the greatest ease. It is capable of uniting with the other earths in compounds which are called silicates, and is the only earth which enters into the formation of soils uncombined with the others or with other elements.

The earth which chemists call by the name of *alumina*, is so named because it is obtained by them in a pure form from the well-known salt called alum, of which it is the basis. Its most marked characteristic is plasticity: that is to say, it may be formed into a paste with water, will then easily receive any form which may be given it, and retain that form unaltered, even by violent heat. It never exists in soils unmixed, but in intimate association, or more probably chemical combination with silica, it is the well-known substance called clay, or argillaceous earth. White clays are this combination nearly pure, and colored clays often contain it with no other addition than metallic coloring matter. Clay retains the plastic property of alumina; it therefore causes soils to be retentive of moisture; and, when they dry, makes them form tough clods or crusts, similar in character to sun-dried brick.

Soils which contain clay are often also mixed with sand, or with an excess of silica in grains, which does not enter into composition of the clay. Such a soil is less liable to form a tough crust than a pure clay, but it will require a very large proportion of sand to destroy this property altogether.

Clay mixed with sandy soils renders them more retentive of moisture. Sand and clay have therefore been used as manures for each other; but it may reasonably be doubted whether all the advantage that has been anticipated by some from this process, can be realized, as such a mixture will be merely mechanical.

Loamy soils are generally said to be mixtures of sand and clay; they undoubtedly usually contain both these earths, and even sometimes a large excess of sand. But we shall give reasons for believing that loams owe their peculiar value to a combination of clay with another substance, by which a change is produced in its chemical characters.

Lime is familarly known to farmers by the same name that is generally used by chemists. It is obtained by the aid of heat from rocks which go by the name of limestones. These are combinations of lime with carbonic acid, which is fixed in them by chemical attraction, but which, when driven off by heat, takes the same form as the air of the atmosphere, or becomes a gas. This gas from this circumstance has been called *fixed air*, by which name it is often known when causing the sparkling and froth of cider and beer. The principal part of limestone is therefore called by chemists *carbonate of lime*. Carbonate of lime is also found in shells, both of those of living animals, and those which exist in the ground in a fossil state. In the former it is mixed with animal matter, which is more or less separated from the latter according to the time which has elapsed since the death of the shell fish.

Marl, in the sense in which the term is used by chemists, is a mixture of clay with carbonate of lime. The English writers on agriculture have not observed this distinction, and the term is sometimes applied by them to a decomposed chalk, which may contain little or no clay; and sometimes to clay which contains no carbonate of lime. In fact, the name is frequently applied by them to any earthy matter found below the vegetable soil, which is capable of increasing its fertility. From this misapprehension, the substances whch go by the name of marl in New Jersey, Maryland, and Virginia, do not correspond with the chemical definition, but are generally beds of fossil shells, mixed in various proportions with earthy and saline matters of various kinds.

Lime is a substance very different in its characters from the two earths of which we have previously spoken. When prepared by heat from any of the original forms of its carbonate, it retains their shape unaltered, but may have its color changed, and always loses considerably in weight. It is now acrid, caustic, and corrosive, and has some properties in common with potash, which are therefore alkaline. Of these the most important is, that it unites with acids to form compounds included in the general class of salts. Of the salts of lime which are important to the farmer, the three principal are—the *carbonate*, which, as we have stated, is found in limestone, chalk, shells, and marl; the *sulphate*, in which lime is combined with sulphuric acid, and which, in combination with water, is the substance so well known to our farmers under the name of plaster of Paris, or less familiarly by that of gypsum; the *phosphate*, which constitutes a large part of the bones of animals.

Lime when exposed to the air, attracts carbonic acid, which is always to be found in the atmosphere; it thus passes back to the state of carbonate, but in so doing gradually falls to powder, and is then said to be *air-slaked.* If slaked with water, it also falls to a powder, which still retains the caustic character of the burnt lime; but this powder, when exposed to the air, unites with carbonic acid more rapidly than when in mass.

Lime, in its caustic state, has the property of rapidly decomposing vegetable and animal substances, thus hastening the natural processes by which they are finally destroyed; or, to speak more properly, have their elements resolved into new combinations. The offensive and unwholesome gases, which are given out by this composition, are absorbed by the lime, and prevented from mixing with the air. The same property is possessed in a less degree by the carbonate of lime, and probably by its other compounds; but in order that either this earth or its compounds shall manifest this property, they must be in small fragments, or, which is better, in fine powder.

Wet sand and plastic clay, and those soils to which they give their characters, also possess the property of absorbing gases; but they have this in a very inferior degree to lime and its compounds. As the gases generated by the decomposition of vegetable and animal substances form a large part of the necessary food of plants, it is obvious that a soil which contains the carbonate of lime, may retain and store them up for use, while they will be lost in soils of a different character.

Carbonate of lime may also be made a most important article in the preservation of the most valuable parts of putrescent manures, until they can be applied to the soil. In this way marl is applied to a great extent in China; the night soil of their numerous population is there formed into cakes like bricks, with marl, and thus loses its offensive smell; but when these are applied as manure to the land, they give out the gases again, as they are required, for the nourishment of plants. So also in Norfolk, the site for dunghills is prepared by a layer of marl, which is incorporated with the manure from time to time, and retains the gases which would be otherwise lost.

Lime may therefore be applied in its caustic form in some cases in agriculture, for it will hasten the decomposition of animal and vegetable matters which might otherwise be inert; it will also neutralize acids, which experieneed farmers well know to exist in many soils, which they in consequence call sour. But the latter purpose will be answered as well by the carbonate of lime, which may be applied as it exists in marl or shells, or as it may be prepared by grinding limestone. Caustic lime is also dangerous in its application, for it will corrode and destroy living vegetables, and hasten the decomposition of the vegetable matter of the soil to such a degree as to injure its fertility. Except upon turf-bogs, and land loaded with timber not wholly decomposed, quick or caustic lime ought not to be used; but to burn lime, and then by slaking to reduce it to the form of fine powder, which is speedily carbonated by exposure to the air, is a more ready, and generally a cheaper mode of obtaining the carbonate in a convenient form, than to grind limestone to powder in mills. Yet for many of the most valuable uses of lime in agriculture, the latter method, if as cheap, would answer as well.

Lime slowly combines with the earth silica, and produces a compound very different in character from either. It is this, to cite a fact in proof of our statement, which gives the hardness and solidity to ancient mortar. The carbonate of lime will serve to form this compound; and thus, when it has had time to act upon sand, it renders a silicious soil more retentive of moisture; while if applied to clay, by combining with its silicious matter, it renders it more friable; and it is to the formation of this compound by slow degrees, that we are inclined to ascribe the valuable mechanical properties of loamy soils, and the gradual amelioration produced by the use of lime, marl, and shells as manure.

Besides silica, alumina, and lime, an earth called magnesia is likewise found in some soils. It is also, in the form of carbonate, a frequent constituent of limestones. This earth has many properties in common with lime; like lime it is capable of neutralizing acids; and when deprived of carbonic acid by heat, corrodes vegetable substances. It probably also hastens putrefaction, and both it and its carbonate are capable of absorbing the gases let loose in that natural process. It is, however, of little interest in agriculture, except as a part of some of the limestones which are used as manure. These, if applied in large quantities, are sometimes very injurious to vegetation; the reason of this is, that magnesia does not repass to the state of carbonate as rapidly as lime, and therefore retains its corrosive quality long after the lime has again become mild by its union with carbonic acid. In less quantities, however, the magnesian limestones may serve as a manure, but their application requires great caution, particularly when the quantity of magnesia amounts to 25 per cent.

All of the simple substances we have mentioned, except perhaps the last, either separate or in various states of combination, exist in plants. The manner and character of the combination is influenced by the vital action of the plant, which causes them to form compounds, often in direct opposition to the manner in which the ordinary laws of chemistry would direct. It thus happens that so soon as the plant ceases to live, these chemical laws, being no longer impeded, begin to exert their influence; and if it be in such a state as will admit of the several elements acting readily upon each other, a decomposition, more or less rapid, of the vegetable structure ensues. It is a law of chemistry, that its action is always aided by the bodies being in a fluid state; and the action is often impossible when the bodies are perfectly free from moisture. Hence the direct chemical action, and consequent decomposition, takes place with greater certainty and more rapidity in green juicy and succulent vegetables, than upon those which have been deprived of moisture either naturally or artificially. Thus grass, if heaped up in a recent state, decomposes, and if but partially dried, is heated, and may even take fire, by the chemical action of its elements; while, if dried by exposure to the sun and air, and then laid up in a dry place in the form of hay, it is almost indestructible. A moderate degree of heat and access to air are also necessary to promote the chemical action by which decomposition is effected. This decomposition is often attended with motion among the parts; and always, if the mass has a liquid form, as in the expressed juice of vegetables, or in the steeps employed by distillers and brewers; it goes in general terms by the name of fermentation. When the vegetable matter abounds in starch, the first change is the conversion of this principle into sugar. Sugar, if thus formed, is next converted into alcohol; as it is, if it previously existed in the plant. The presence of alcohol gives the liquid in which it exists the character of vinous liquors, and if these are permitted to remain in a turbid state, a farther fermentation converts them into vinegar; and finally vinegar is farther decomposed, and the vegetable matter, giving out an offensive smell, is said to putrefy. If the substance be not an expressed juice, or liquid steep, these several stages of fermentation ensue with rapidity, may be going on at the same time, and are sometimes so speedy in their course, that no other action but the putrefactive fermentation can be detected. Animal bodies are subject to the same laws, and go through the same stages of fermentation, but the rapidity which they run into putrefaction is even greater; still there are some cases, as in that of milk, where the vinous stage can be occasionally, and the acetic distinctly, observed. Thus, a vinous liquor is prepared in some countries from milk, and the sour taste which appears in it when kept, arises from the presence of vinegar.

In the several stages of fermentation, parts of the vegetable assume the form of gas or vapor, and are given out to the air. The gases which have been detected, are carbonic acid, a gaseous compound of carbon and hydrogen, and in some instances ammonia. The vapor is that of water, which escapes in greater quantities than it would under ordinary circumstances, in consequence of the heat with which the process is attended. If exposed to rain, soluble salts, with earthy and alkaline bases, are washed from the mass. Finally, a mass of earthy consistence alone remains, which on examination is found to be made up of earths, insoluble salts, and carbon, being, in fact, identical with vegetable mould.

We may hence infer that the following elements exist in vegetable bodies:

1. Oxygen, developed in the carbonic acid and water.
2. Hydrogen is in the water and carburets of hydrogen.
3. Carbon.
4. Earths.
5. Alkalis.
6. Nitrogen, occasionally developed in the form of ammonia.
7. Acids, remaining in the insoluble, or washed away in the soluble salts.

The chemical examination of vegetable bodies ought of course to lead to similar results. This examination has been conducted in three different ways.

1. With the view of discovering the nature of the compounds, called vegetable principles, which exist ready formed in plants.
2. For the purpose of discovering the chemical elements contained in these principles.
3. By the destructive action of heat, under which some of the elements are wholly separated, and others enter into new combinations.

In the first of these methods there have been detected:

I. Certain peculiar acids, of which we may cite
   (1) Acetic acid, which, mixed with water, forms common vinegar;
   (2) Citric acid, which is found in the lemon and orange;
   (3) Malic acid, which exists in the apple;
   (4) Tartaric acid, in the juice of the grape;
   (5) Oxalic acid in the wild sorrel.

II. Certain substances of alkaline character, found principally in medicinal plants, to which they give their peculiar virtues.

III. Gum, resin, oils, sugar, starch, and two substances approaching to animal matter in their characters, namely, albumen and gluten; the former of these has a resemblance to the white of eggs, the latter to animal jelly or glue.

Many other principles are separated by the same method in different plants, but need not be enumerated by us.

The basis of this method consists in acting upon vegetables by water, ether, or rectified spirits (alcohol,) and the principles above enumerated are either simply, or in the state of combination in which they exist in plants, soluble in at least one of the liquids we have named.

In all cases some insoluble matter is left, and this is known by the name of the woody fibre.

When these principles are treated by the second method, oxygen, hydrogen, and carbon, are the uniform results, but in different proportions in the different cases; nitrogen is also detected in some of them, as, for instance, in the alkaline principles, and in gluten. This method does not appear to be adequate to determine whether earths and alkalis are, or are not, parts of these vegetable principles. From the very remarkable fact, that some of those substances, which are very dissimilar to each other, yield exactly the same proportions of oxygen, hydrogen, and carbon, we may fairly conclude by chemical analogy, that one or the other, or perhaps both, contain some substances which have escaped the analysis. As an instance, we may cite starch and sugar, whose characters are so dissimilar that no danger can exist of mistaking the one for the other; and yet their analysis by the second method gives identical results.

The third method may be understood by comparing it with the process used in making charcoal. If this be so far altered that the heat employed shall not arise from the combustion of a part of the substance to be examined, but from one merely used as fuel, and if the matters which escape in smoke are condensed and collected, we shall have that employed occasionally on a large scale by operative chemists. In this way, coarcoal will be, as usual, obtained in the solid form. The condensible products will be water, tar, turpentine, or resin; and the acid which gives that character to vinegar, but which, in the present case, in union with the tar and water, is called pyrolignous acid.

If the charcoal be burnt in a current of air, all its carbon is converted, by union with the oxygen of the atmosphere, into carbonic acid, leaving a residue familiarly known as ashes. The ashes are made up partly of soluble and partly of insoluble matter. The soluble matter is separated by the familiar process of making ley, and the ley, if evaporated, leaves the solid substance so well known as potash.

Potash is principally composed of a carbonate of potassa, but contains, besides, silica, rendered soluble by the alkali, sulphate and muriate of potassa, and a peculiar acid known by the name of ulmic, which is a compound of carbon, hydrogen, and oxygen. The insoluble part is made up of carbonate of lime, sulphate and sometimes phosphate of lime, silica. The carbonate of lime has probably in no case existed in the living plant, but arises from the destruction by heat of the peculiar acid of the plant; as, for instance, the citric, the oxalic, or the tartaric; all of which are by fire converted into carbonic acid.

The quantity of ashes is extremely various, as is their proportion of the several soluble and insoluble substances, we have mentioned. Thus the ashes of the stalk of Indian corn yield 12¼ per cent. of ashes, while the soft woods do not furnish more than two parts in a thousand. The proportion of the sulphate and phosphate of lime is even more various. Thus, in some cases the presence of the sulphate is hardly perceptible, while of the ashes of clover it forms a large proportion of the whole weight. Phosphate of lime is found in the proportion of fifteen per cent. in the grain of wheat.

Water is not only one of the principal component parts of all plants, but is also the sole vehicle of their nutriment. At each extremity of the small fibres into which the roots of plants are divided, is an opening through which that fluid enters; and it appears that, except in the case of a plant having lost its vigour by continued drought, it is only through this channel that water can enter. By a powerful action inherent in living vegetables, water, which, with all the matters it is capable of holding in solution, becomes the sap,* is raised to the highest parts of the plants, and forced to their most distant extremities. It has been ascertained that plants do not possess the power of rejecting even those substances which are most noxious to them; it is therefore probable, that the character of the fluid admitted, is the same in all the plants which grow upon the same soil. Whether it undergoes any change in the root does not appear certain; but it has recently been maintained that every description of plant throws off by the surface of its roots such matter as, if retained, would be injurious; but this opinion does not appear to be well established.

The sap, when carried up to the leaves, undergoes an important change; principally owing to the action of solar light. When exposed to light, the leaves of plants give out oxygen in considerable quantities. This proceeds from a decomposition of the water and carbonic acid, the remaining elements of which two substances, and a portion of their oxygen, enter into new combinations. These combinations have different characters in different vegetables, but are most familiarly known in the shape of gum and resin. These still contain the earthy and saline matter carried up by the sap, and after they are formed, return downwards towards the roots. In their descent they deposite the several parts which minister to the growth of the plant—the leaves, the bark, and the woody fibre. They also appear to be forced with powerful energy into the flower and the growing fruit, and in these a still more important action is carried forward, by which the reproduction of the species is ensured.

The matters which the water that enters by the root may hold in solution, are either derived from the atmosphere or from the soil. In its passage through the air it will carry with it a considerable proportion of carbonic acid, and all the sulphuretted hydrogen it meets with. It will also take up a small quantity of oxygen, and of carburetted hydrogen, and a still less quantity of nitrogen. From the soil it will take all the more soluble salts, small quantities of sulphate, phosphate, and carbonate of lime, provided they be present, and silica. So also if the soil contain animal matter, or vegetables of which nitrogen forms a part, the ammonia generated by their decomposition will likewise be dissolved by the water. In like manner the carbonic acid, which has arisen from the decomposition of vegetable or animal matter, and has not yet escaped, and the soluble compounds of carbon, oxygen, and hydrogen, which are generated by the same process, will have been taken up, and carried by the water into the root of the plant. It will thus appear that, contrary to the opinion of Mr. Puvis, the atmosphere furnishes but little of the fixed elements of plants, with the exception of sulphur and carbon; and that even if the growth of plants were to depend wholly upon the carbon obtained in the form of carbonic acid from the atmosphere, their growth must be slow and feeble. It will also appear, that if lime do not exist in the soil, but few plants can find nourishment; and that for the ripening of the seeds of grain, phosphorus must be furnished also. The latter substance may be absorbed in small quantities from the phosphuretted hydrogen, which is occasionally present in the atmosphere; but a more certain supply ought to be sought in putrescent manure, and particularly in that of animal origin.

The uses of lime in agriculture, as will appear from the foregoing remarks and the reasoning of the essay, are as follows:

1. When a soil contains inert animal or vegetable matter, their decomposition may be promoted, and it may be rendered fit for the food of plants, by the addition of caustic lime.

2. If the soil contain acid, that may be neutralized either by caustic or carbonated lime, and besides, the organic matter whose decomposition may have been prevented by the acid, will be permitted to putrefy.

3. Soils containing too much silica, or in other words those which are sandy, are made more retentive of moisture by the addition of lime or its carbonate.

4. Clays, may be rendered less retentive of moisture, and more friable by the same means.

5. The gases which escape when vegetable or animal matter putrefy, are retained in the soil by means of lime or its carbonate; and thus a given quantity of manure, or the original vegetable matter of the soil, will retain its efficacy longer. By a recent discovery, it has also been ascertained that the decomposition of plants yields a peculiar acid, called the humic, which forms with lime a salt sparingly soluble in water. The generation of this salt also serves to render the nutriment contained in the soil more lasting.

6. Lime and its compounds are absolutely necessary, as constituent parts, to the growth of many plants. The sulphate is essential to the growth of clover, and the phosphate to that of

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* See Roget's Bridgewater Treatise.

wheat. Hence the efficacy of plaster of Paris and crushed bones as manures.

7. If lime or its sulphate be employed as the means of raising green crops, which have but small exhausting powers, the fertility of a soil may be maintained by ploughing them in, or increased by using them to feed cattle whose manure is applied to the ground.

ON THE RAIL ROADS OF NORTH CAROLINA, AND OF THE SOUTH GENERALLY.

Raleigh, May 25, 1836.

To the Editor of the Farmers' Register.

Your friend G. L. C. may be surprised to see me still alive. I attribute my miraculous escape to the fact that his first shaft has never reached me. He alludes to a "partial reply" which he had before made. This communication must have been sent to some other paper, or it must have been lost on its way to your's. I will hope the last, as I am not so magnanimous as to wish, with Dogberry, to see myself "writ down an ass;" and, perhaps, G. L. C. may spare me a repetition, when he sees how penitential I am under the castigation already received. If this reply has appeared in the columns of some other paper, I must apologize for not having seen it, by mentioning that the nature of my occupation prevents me from reading newspapers with any regularity.*

It is evident that G. L. C. has misconceived me entirely. I attempted to offer him some friendly advice, and he meets me with the front of Mars. I wished to admonish him of some of his foibles, and to persuade him to examine a little more closely into the subjects upon which he writes. I hinted, as gently as possible, that he gave his thoughts too wide a range, and thus subjected himself to the imputation of being desultory. I looked, Mr. Editor, to receive some thanks for my good advice, and to witness signs of improvement. Imagine my disappointment, then, when I found my advice construed into an attack; and I saw your correspondent unchanged in his dictatorial manner of settling questions, and holding fast to his old habit of touching upon every thing at the same time.

Mark the forcible style of reasoning. To prove that he was right in the plans which he advocates, he says, "It is now fully seventeen years since I imbibed the idea of the possibility of making the Chesapeake the great mart of American commerce, and Norfolk, the great gate through which it must pass." * * *

* * G. L. C. imbibed an idea, seventeen years ago—and, therefore, he must be excused for considering it perfectly orthodox, and for looking upon every thing which opposes it as founded in "local interests, local prejudices, and local partialities."

"O wad some pow'r, the giftie gie us,
To see oursels as ithers see us."

We shall see, presently, whether G. L. C. has any of these local interests, prejudices, and partialities. I will not dwell on his fear of the "Empire State," nor on his idea of bringing the whole American commerce through Chesapeake Bay, for the good and valid reason that he thought of it seventeen years ago. I will take, for my purpose, an opinion clearly expressed in the former communication to the Farmer's Register, and which I understand G. L. C. as alluding to in the "trust" appended to his congratulations on the success of the subscription to the Raleigh and Gaston road. I mean the notion of Weldon being the only place on the Roanoke where a road from Raleigh should terminate. Can any one show me a more rank local prejudice? I can give reason upon reason, to prove that this is a prejudice, founded in no just reasoning. But permit me to return to the text. G. L. C. laughs at my speaking of "those who have long and zealously labored to promote a favorite scheme," (speaking of the Raleigh and Gaston Rail road;) and he taunts me with the silence of the Raleigh papers in time past. Now, your correspondent has yet to learn that there is a zeal which does not display itself in newspaper essays, and county meetings. I ask no stronger proof of the previous existence of such a zeal, than the success of the project when it was brought before the public.

But G. L. C. must not suppose that my ideas are confined between the Roanoke and Raleigh. When I speak of a favorite scheme, I regard the Raleigh and Gaston road as a very small link in a vast chain of public works, extending from the northern to the southern extremity of our Union—a chain of communication passing through the interior of the country, and connecting all the most important cities and towns of our land. When I speak of those who have long and zealously labored to promote this scheme, I speak of all the distinguished men, as well as the *humble unknown*, throughout our country, who have, at any time, contributed to this noble and gigantic scheme. I would ask G. L. C. if even *his* pen can stop the march of this work. Already has this line been completed, (with the exception of a few short gaps, which will soon be filled up,) from the city of Boston to Gaston, on the Roanoke. And two years will scarcely elapse before this line is extended to Raleigh. Nor do we propose to stop here, nor even at the Pee Dee, which our friend "trusts" we will reach. No one, who has watched the course of events, can doubt, for a moment, that the scheme will reach its original destination. If there has been a scarcity of newspaper flourishes, about this scheme, it can scarcely be said there has been "apathy" in prosecuting the work. Will G. L. C. take his map, and stretch a silk thread from Boston to Washington City, from Washington City to Petersburg, from Petersburg to Raleigh, and from Raleigh, through Columbia, southwards? I may safely leave him to follow out the thoughts which will be suggested by this experiment. I will aid him with one remark. Does Gaston appear to be too high up the Roanoke for a rail road between Petersburg and Raleigh to cross that river at? Or, does Weldon seem to be nearer the proper point?

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* It is proper to state, in explanation to both our correspondents, that no previous reply of G. L. C. was received; and that we had supposed, from the manner in which it was referred to by him, that some such previous piece had been inserted in some other publication. Ed.

Let him examine his map, and answer this question.

G. L. C. complains of my want of confidence in the stock of the Wilmington and Halifax road. He suggests that a line from Darlington and Harleesville, S. C. to Fayetteville, to Halifax, via Waynesborough and Tarborough, &c. &c., would make travellers forget that Raleigh was in existence. I will readily grant that this line would not secure the travel, if it were not extended south from Raleigh; and if, at the same time, the line he suggests were completed. But suppose the Raleigh route extended south—suppose both the conjectural lines finished, which, by the bye, is an exceedingly liberal supposition. I will again ask G. L. C. to apply the thread to the map which is lying at his elbow—for, without a map always at hand, no human memory could retain the names of all the towns, villages, rivers, &c. which are mentioned in his essay. I ask him to view the two routes, and weigh their merits strictly, but candidly.

Consider the superiority in direction of the route via Raleigh. The advantage of passing through so many towns: (three cities which this line passes through, and which are missed by the other, are the capitals of North Carolina, Virginia, and the United States.) Take into account, also, the healthy country through which this line passes; and then let him recollect the voyage across the bay—which, though often pleasant, is frequently disagreeable, and sometimes dangerous. I hope that he will, then, give up his local prejudices, and cease to oppose such a liberal and extended plan. Indeed, Mr. Editor, I cannot persuade myself that any rational man can examine the map, and not see the striking advantages of the Raleigh route, unless he should be blinded by those sectional prejudices which G. L. C. so much abhors.

Your correspondent prides himself on Col. Long's having recognized the route he prefers. What mark of recognition Col. Long bestowed on this route, I do not now remember, not having the report by me. I apprehend, however, that, since the funds have been provided for making a rail road from Raleigh, to meet a road from Petersburg, at the Roanoke, the opinion of Col. Long would be materially affected by the change of circumstances.

The last notice taken of P. Q., in this miscellany, is a reference to a certain project which he mentioned in his former communication. Now, it was particularly cruel in G. L. C., under existing circumstances, to pretend to understand me as seriously proposing to confer the powers described in the paragraph alluded to, on any body of men. I thought I had sufficiently guarded myself against such a construction. I said that there were certain objects to attain; that I saw no feasible plan for attaining them: but that I would endeavor to describe what end I thought desirable—leaving to himself among others to suggest some plan to secure the good, and shun the attendant evil. In short, I pretended not to give a practicable scheme at all, but merely to throw out hints to set more competent minds to thinking. The whole of the paragraph which follows the one just referred to, commenting on what G. L. C. calls my heterodox notions, is a tissue of false reasoning, supported by an example of the merits of which I cannot judge, for want of information on the subject.

How are rail roads to be made, if individuals are to realize no profits from them? Must government make them? I believe that it is a well established fact, that works made by government are far more expensive than those made by individual enterprise. It follows that a government ought to endeavor to stimulate private enterprise, rather than to embark its own funds. If G. L. C's ideas have been running on these subjects, seventeen years, he ought to have found out that there is no disposition among men to incur expense, for the mere pleasure of "indirectly adding infinitely to the wealth of the community." If he feels any ambition to act in such a disinterested manner, he is in a fair way of having abundant opportunities, in some of his own pet schemes.

I am sorry to see a man of such extended views, echoing the demagogue's cry of "odious monopoly." I grant that no greater monopoly should be allowed than would be sufficient to draw out the capitalists, and induce them to invest their money. But, without a reasonable degree of protection, it would be in vain for a state to hope that her own citizens, or others, will invest money within her limits.

You will perceive, Mr. Editor, that I have not followed your correspondent through all his ramblings, but have only endeavored to reply to the few casual notices with which he has honored me. I confess, however, that it was sometimes difficult to tell what was intended for me, what for Mr. Editor, and what for Congress, and the various legislatures. I regret that the piece was not divided into chapters, and each of our shares put under separate heads.

P. Q.

SKETCH OF THE AGRICULTURAL AND ECONOMICAL LABORS OF SIR JOHN SINCLAIR.

[It is from a biographical memoir of this distinguished man, of considerable length, and which is not yet concluded, that we extract this sketch of his labors as an improver of the soil and the wealth of his country —labors, which though highly advantageous in their results to his own private interests, were immeasurably more beneficial to Great Britain and to mankind. His biographer says that "from the days of Cato the Censor, down to those of Curwen of Workington Hall, there is no greater name in the annals of Agriculture, than that of Sir John Sinclair." This may, or may not, be exaggerated praise; but it is certain that no agriculturist has ever been directed by motives more purely public spirited and philanthropic, and none has met with more distinguished success, or gained so much celebrity.

In making these extracts, we have passed by all of Sinclair's public life that was not connected with agricultural and economical improvement. But there remains another portion, to which the memoir has not yet reached, which, if well treated, will deserve a place in this journal. This is the founding of the British Board of Agriculture, and the commencement and progress of the county surveys and reports, and other important measures instituted and effected by the Board—the whole of which produced as much benefit to the agricultural interests of Britain, as the plan, and its execution, reflected honor on the distinguished founder.]

Extract from the Quarterly Journal of Agriculture.

On his return to his native country in 1787, Sir John commenced those improvements on his own estates, which have tended in a great measure to give a new physiognomy to the shire of Caithness. In a paper, drawn up by himself at a subsequent period, he well remarks, "That it is a peculiar disadvantage attending the cultivation and improvement of a remote and neglected district of a country, that every thing is to be done, and that a great variety of new and important objects must be attended to at one and the same time. Those who live in a part of the island, that has already made considerable progress, can hardly form an idea of the difficulties which must be surmounted, when towns and villages must be erected, as centres of communication and business; when roads and harbors must be made, for the sake of domestic and of foreign intercourse; when manufactures must be established, to provide employment for the surplus population, which an improved system of agriculture, and the enlargement of farms, necessarily occasion; and when new breeds of animals, new instruments of husbandry, and persons skilled in new modes of cultivation, must be introduced from distant parts of the kingdom. If it is possible, however, by the application of a great capital, and of great attention, successfully to carry on these objects together, the one has a tendency to promote and to encourage the other; the spirit that is excited for the improvement of one article, rouses a similar spirit of energy in regard to another; and a new race of people is in a manner formed, who, from a state of torpor, ignorance, idleness, and its concomitant poverty, are animated to inquiry, roused to exertion, and impelled to obtain by their industry the acquisition of wealth."*

Nothing can be conceived more unpropitious, in an improveable light, than the estate, as it originally passed into the hands of Sir John Sinclair. It was situated in five parishes, Thurso, Halkirk, Reay, Wick, and Latheron; comprehended 100,000 acres, or more than a quarter of the whole surface of the county of Caithness; and was estimated at nearly a fourth of the whole rental. Excepting a few large farms, or what are called *Mains*, it was at that time occupied by a number of small farmers, to the number of eight or nine hundred, holding their possessions in what are called *rig and rennel*, or intermixed with each other; and, beyond the outer fence of this motley farm, were nothing but wide unenclosed commons, free to all the neighboring proprietors. A moiety of rent was paid in money; but by far the larger portion of it in grain, lamb, poultry, and other articles of produce.

Sir John found it, in the first place, necessary to establish some large farms, with a view of inducing persons of a competent property, to direct their attention to agricultural pursuits, as a suitable means of employing capital. As an incentive to others, he took into his own hands the farm of Stonefield, originally possessed by eight of the small tenantry; yet, deeming that a mixture of small farms is advantageous in a thinly peopled country, he encouraged them to settle in towns or villages, or in what have been since termed cottage farms. Having brought it into a proper state of cultivation, he let it at a very moderate rent, so as to induce the tenant to build a suitable house, and complete the improvements which had been commenced. To insure this, certain stipulations were entered into, by which the tenant was obliged to go on liming and marling to a certain extent every season; as, without this agreement, it was quite evident that the improvements would neither have gone on in the same degree, nor with the same rapidity.

To give the new system a fair trial, regular plans were drawn up of the different farms, by which it was ascertained how they could best be distinctly divided, and in what situations the houses and offices should be built. Services of every kind were abolished, as also *thirlage*, or restriction to particular mills. The miller was made a separate profession, whose care it was to bring the corn to the mill, and to carry it to market. The tenants were tied down to a regular rotation of crops, until the advantages of an improved system of husbandry should be made apparent to them; and every assistance was given them in procuring proper seeds, especially clover, rye-grass, and turnip. The selling of peat was prohibited, as an obstacle in the way of the tenants for collecting manure for their farms; and the burning of coals for fuel was recommended, principally with the view of keeping their whole attention directed to their farm management. Every facility was at the same time given them of purchasing marl; and lime was delivered to them at Thurso, at the lowest price at which it could be imported. Small premiums were also distributed, as an encouragement to industry. Many judicious hints were also at the same time distributed among the farmers. They were recommended in the taking of land to have sufficient capital at starting, and never to depend on credit; to study their profession carefully before commencing it on their own account, and rather to cultivate fifty acres well, than a hundred in a slovenly manner; to endeavour to raise the best grain, to keep the best stock; and to cultivate the ground at the least possible expense.*"

By following out this system of improvement, in a short time 2181 Scotch, or 2617 English acres, were brought under its operation—1046 as pasture, and 1135 as arable land; the farmers themselves confessing, that they had themselves been amply remunerated, wherever they had rigorously followed out the chart prescribed for them.

A plan was also laid down for letting the hill farms on Skinnet and Leurary. It was suggested that they should consist, as nearly as possible, of twenty-five acres each, with an acre for house, garden, and offices, while the remaining twenty-four should be subdivided into fields, each of four acres, calculated for a rotation of six years. The leases were to be for twenty-one years, and from one to five shillings an acre as rent for the first seven years, with a gradual increase during the remainder of the lease. On entering upon his lease, each tenant, on finding security for his laying out the same properly, was to get a sum of money to assist in building operations, and, at its expiry, a certain additional sum was to be allowed him, according to the value of the premises erected. The position of the house and garden was to be under the direction of the proprietor.

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*See Sketch of the Improvements carrying on by Sir John Sinclair, Bart. printed anno 1803.

* Vide Appendix to Henderson's General View of the County of Caithness, p. 42–46.

It was stipulated that twelve acres should be put into a state of cultivation within the three first years, and four acres every year after, until the whole were brought under the plough. The subdivision of this part of the arrangement was, that, after the first seven years, the tenant should have eight acres in corn, eight in pasture, four in green crops, and four in sown grass, either cut green, or made into hay, and the rotation was to be thus—1. fallow, or green crops; 2. grain, with grass seeds; 3. grass, either made into hay or cut green; 4. pasture; 5. ditto; and, 6. oats; and so on till the expiry of the lease. The tenants were also to be allowed at entry a sum of money for enclosing, on finding security for executing the same, according to a plan laid down; and sheep, being so destructive to hedging, planting, and similar improvements, it was stipulated, that none should be kept without the express leave of the proprietor.

In a short time no less than fifty farms on this plan were laid down, in addition to the tract bordering on the old arable fields. Great exertions were made to bring this extensive tract into cultivation, and, even within the first year, considerable progress was made. The greatest difficulty the settlers experienced, consisted in the provision of hay and straw for their cattle and horses, until they could raise those necessaries themselves. In cultivating extensive wastes, it is for this reason necessary that there should be some arable land in the vicinity; and, from this circumstance not being sufficiently attended to, many attempts at improvement have been entirely frustrated, which might otherwise have proved successful.

The improvements in the parish of Wick and the lower part of the parish of Latheron were, at the same time, carried on with great energy and success by Captain Brodie of Hopeville. Houses were built, mosses drained, villages planned, wastes inclosed, harbors cleared, and roads made. On the grounds of Wester Clyth and Roster, great attention was also paid to the fisheries by Dr. Henderson. Where only one boat had been employed in the herring-fishery, he, in a short time, increased the number to thirty, exclusive of a number of small ones; and the produce of one year was three thousand barrels of herrings.

The improvements on the estate of Langwell were on a still more extensive plan, and were carried into effect with even still greater success. Besides the enclosure of arable, and the improvement of waste lands, it was resolved to raise the value of that extensive property principally by converting it from cattle into sheep farms. The great difficulty at the outset arose from the estate being occupied by not less than eighty small tenants, whose united rental did not exceed two hundred and fifty pounds per annum. Nothing was bred but a few cattle, and nothing fed but some wandering red deer, on the upper part of the property. Humanity, however, required that five hundred offenceless individuals should be provided for; and this was done by adopting the plan of cottage farms, each consisting of two acres of arable land. In reference to this property, Sir John Sinclair has well remarked, that "of all the means of bringing a mountainous district to a profitable state, none is so peculiarly well calculated for that purpose as the rearing of a valuable breed of sheep. A small proportion alone of such a description of country can be fit for grain; and, in regard to cattle, for every pound of beef that can be produced in a hilly district, three pounds of mutton can be obtained, and there is the wool into the bargain. Besides, wool is an article easily transported, of essential use, for which there is in general a regular demand, and which is capable of great improvement. Sheep, also, generally sell with less variation of price than cattle, and are easily driven to market.*"

In a pecuniary point of view, the advantages which resulted from these improvements on the estate of Langwell were very great, and within a few years raised the rental from under three hundred to above sixteen hundred pounds per annum; and, in a moral point of view, were of incalculable benefit to the natives of the district. A spirit of industry and emulation was introduced, and the women had spinning-wheels distributed among them by wheel-wrights, who were set up there for that purpose. Nothing, at first sight, could be more forbidding, more complicated, and operose, than this system; and yet, by perseverance, it was made to answer beyond the most sanguine expectations. A rude, was converted into a civilized district, and the country was improved, without being depopulated.

In connection with the estate of Langwell, it should be mentioned, that at the time when Sir John purchased it, he had commenced his plans for the improvement of British wool; and it occurred to him as a most proper place, to ascertain whether a certain breed of mountain sheep, to which had been given the name of *Cheviot*, would thrive in those more northern districts. Alike in Northumberland and in Caithness, the idea was scouted as visionary. Among the northern mountains, sheep had never been kept during winter, except in houses; and it was thought impossible to make them brave the boreal storms. Sir John, however, was determined not to abandon the attempt without trial; and knowing that, if he made it on a small scale, and trusted the sheep to the care of native shepherds, they would be allowed to perish, he sent north a flock of five hundred at once, accompanied by the most experienced shepherds. The succeeding winter happened to be a stormy one, with great falls of snow; yet the flocks prospered, and few suffered either from disease or want. The principal loss arose from the attacks of foxes in spring on the young lambs; and it required great vigilance to keep that nuisance under. In a short time it was found, that instead of perishing, the Cheviot sheep throve fully better in Caithness than even on their native hills, and their numbers had increased to six thousand.

When Sir John purchased the estate of Langwell, the rental was only £282, and he bought it for £8000; but so much had he increased its value by improvements of every kind, that when he was subsequently induced to sell it, it brought him the sum of £40,000—an increase quite unprecedented in the annals of buying and selling.

Having thus described, in a general way, the plan of agricultural improvement introduced by Sir John Sinclair into Caithness, both as adapted to the valley and mountain districts, we cannot do more than merely allude to the concomitant improvements accomplished, in the way of forming roads, raising plantations, working mines, establishing inns for the accommodation of travellers, constructing harbors, and opening up new channels for the extension of commerce and manufactures.

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* Vide Appendix to Henderson's General View of the Agriculture of Caithness, p. 58.

Great difficulties were at first experienced in improving the roads in the county of Caithness, the soil being either of clay or peat, and the materials for making or mending them of a softish quality. Sir John, however, got Government interested in the undertaking; and perhaps the greatest exertion ever made in road-making in Scotland was when he had 1270 men employed at one time, along the side of the hill of Bennichiel, and laid down six miles in one day. Nor was the situation of Caithness more favourably adapted for the growth of plantations, being a promontory, two-thirds of which are surrounded by the sea, whose spray is so injurious to the growth of trees. Add to this, that the soil of a great part of it lies on a flat rock, preventing the roots from penetrating to a proper depth. Attempts were however made, with considerable success in many places that seemed of little promise; and, in the parts adjoining Sutherland, on the eastern coast, not less than 320,000 Scotch firs, besides 22,000 larches, ashs, mountain ashs, elms, and sycamores, were thriving in situations which at one time appeared destined to perpetual sterility and bleakness.

In the fisheries, a new source of wealth and industry was opened up to the inhabitants; and they, to this moment, continue, as all know, in a most thriving state. Indeed, no district in the British dominions is better calculated for that branch of commerce, there being above forty different varieties of fish, either in the fresh waters of the county or in the adjacent seas. The greater part of the cod with which the London market is supplied, is taken almost within sight of the town of Thurso, and the fishing-smacks employed for the purpose rendezvous at Scrabster Road, in its immediate neighborhood. The most important branch of the fishery, however, is that of herrings, which are cured for home or foreign consumption. Sir John Sinclair early foresaw the extent to which these fisheries might and would be carried; as also their vital importance to the prosperity of Caithness. So early as 1787, he induced the Messrs. Fall of Dunbar to re-establish the cod-fishery, which had been nearly abandoned for many years; and he furnished capital to John Sutherland of Wester, and to John Anderson of Wick, to enable them to commence a herring-fishery on the east coast, which ultimately proved so successful as to have yielded, in one year, above 200,000 barrels.

Sir John also procured public aid for increasing harbor accommodation; and, at the expense of £12,000, that of Wick was completed. An act was also obtained for constructing the harbor of Thurso, which if completed would prove so beneficial to the neighborhood. From the sale of the surplus produce of the farmer, an incitement was given to commerce; and while he was accumulating capital wherewith to improve his stock, the quality of his grain, and his implements of husbandry, as well as increase his domestic comforts, his intercourse with the trader tended to mutual prosperity and enlightenment. The commerce, which had hitherto been insignificant, and consisted chiefly of grain, cattle, and fish, rapidly increased; and a trade has been opened up, not only with the Baltic, but with the West India Islands. Tanneries have been erected, bleachfields laid down, and woollen manufactories established.

Impressed with the idea, that wherever a number of inhabitants are collected together, they furnish a market for agricultural produce, which of course increases with the demand, Sir John used every exertion to enlarge the town of Thurso, at that time containing sixteen hundred inhabitants. It was, however, very irregularly built, and in some parts so crowded as to be prejudicial to the health of the people. He therefore resolved on laying down the plan of a New Town, to be built regularly, and in which he consulted both beauty and convenience. How well this has succeeded the reader need scarcely be reminded. Its situation for commerce is admirable, being within a few hours sail of the German and Atlantic Oceans; and nothing can surpass its convenience for fisheries, that great source of northern wealth. It is pleasing to think, that almost by the unaided enterprise of one mind, what was in the memory of man the bare bank of a Highland river, is now a flourishing town, with its churches and market-places, its boarding-schools and academies, its shops and warehouses; that the silence and the solitude is now filled with the hum of human life, and that elegance and comfort have taken the place of those necessities, which chained down man to an estate so much beneath his physical capabilities, as well as his immortal destiny.

Such is a meager and general outline of the improvements which Sir John Sinclair planned, attempted, and successfully carried into execution, in the shire of Caithness. Let it be remembered, that when he succeeded to his estate, the whole county might be said to be in a state of nature. The tenantry had not a single cart in their possession; and, even if they had, there was not a single road anywhere. Every article, not excepting manure, was carried on horseback, and the ground was almost everywhere cultivated on the common field, or alternate ridge system. So numerous were the disadvantages under which his improvements—by many they were considered mere innovations—were commenced, that they would have daunted and cooled a spirit of ordinary energy and enterprise. He had not only to arrange plans, but he had to provide the adequate capital for carrying these into execution. He had not only to procure from other districts the hands requisite for various branches of the intended system of improvement, but he had to overcome the prejudices, many and deep-rooted, of the natives themselves, and stimulate them to worthy exertion. All this was carried on in the midst of a foreign war, which diminished the number of laborers, checked circulation in the remote provinces, and augmented public burdens, already but too severely felt. How successfully, however, may be attested by comparing the population census of the kingdom in 1810 with that of 1820. It will there be seen, that the proportionate increase is greater in Caithness than in any county in the British empire; and not only was the population numerically greater, but one of a very different kind, from what had inhabited these shores in previous generations. Enterprise, industry, morality, and religion, went hand in hand together. The coasts were occupied by extensive fisheries; and the soil, allowing for difference of climate, exhibited as excellent, and as skilful management, as the most celebrated districts of the Lothians.

Pope, however, has well remarked, that "envy will follow merit like its shade." Many minds were incapable of taking in the extent of operations, which to their feeble comprehensions seemed theoretic and Utopian. There was too much uprooting of old prejudices not to excite detraction and invidious surmises; and these feelings were necessarily aggravated by the circumstance of its being requisite to remove many from their humble, and rude, and unambitious, yet ancestral dwellings, to give scope for what sceptics set down as mere experimental speculations. Attacks, on this score, were made upon Sir John, even in some of the English newspapers. But to more than counterbalance the ignorance and ingratitude regarding the character of a great man, which these manifested, he was presented in 1811 (when his plans had received "ample room and verge enough" for practical application,) with an address from the Magistrates of Thurso, "acknowledging with gratitude, that, amidst other pursuits of a more extensive tendency, the improvement of his native county had been the peculiar object of his care and attention." Previous to this, the Lord Lieutenant and Freeholders of Caithness had tendered him a vote of thanks for having carried through so many measures, which had proved "a solid foundation for the future prosperity of the county." Before leaving this part of our subject, it is pleasing to add the testimony of one of the great living ornaments of the Scottish bar, to the merits of the subject of this biography. Mr. Forsyth, in his dedication to Sir John Sinclair of the fifth volume of the Beauties of Scotland—that containing the Account of Caithness—eulogises him in the following terms:—"Sir, this volume is respectfully addressed to the distinguished promoter and patron of the important art to which nations owe their subsistence; of whom, in future times, it will be said, that he found means to diffuse among mankind a larger portion of useful knowledge than had been accomplished by any individual of his own, or of any former age." We make no commentary on these sentiments so true in themselves, and so simply, yet beautifully, expressed. On the one hand, it must have been delightful to know, that the merited subject of such a panegyric was of his own nation and generation; and, on the other, it must have been no small gratification to be thus made aware, that the philanthropic labors, intended for the good of all mankind, were at least appreciated by the wise and good among them.

From the Arcana of Science, for 1836.

CHEMICAL COMPOSITION OF BROTHS.

The erroneous notions entertained by many respecting the administration of soups and broths, as articles of nourishment to invalids, may derive some corrections from such investigations as the following:—Five hundred grains of meat, deprived of bone, fat, and tendon, were put into a litre and half of distilled water, and gradually brought to the boiling point, and continued so for five hours, renewing the water as it evaporated. The decoction had the odor of soup, an agreeable taste, and yellowish color, contained 12 parts in 1,000 of animal matters, and 3 parts in 1,000 of inorganic: spring water, containing sulphate and carbonate of lime, afforded a broth of less odor, and inferior taste. When the meat was put into boiling water at once, the proportion of animal matter in solution was less, and the broth inferior to that obtained by heating gradually. The difference in flavor of broths appears to depend more upon the nature and proportions of the saline than the animal ingredients. In boiling meat in the usual manner, the albumen is partly dissolved before the temperature is raised to the degree at which it coagulates, when the remaining portion is partly coagulated, rises in scum, and partly dissolved in the water; the cellular membrane is partly dissolved, but some of it remains in a more or less indurated condition. The fibrine of the muscle is hardened, but none of it is dissolved, and if it was not for the cellular membrane, albumen, and oil between the fibres, would prove a refractory article of diet. The fat remains partly entangled in the meat, and partly floats at top; the flavor of broths arises from it in a considerable degree: much change is effected by evaporation, decomposition, and new combinations, during protracted boiling, and volatile parts upon which the flavor principally depends being dissipated. These experiments were instituted to determine the nature of the peculiarities of broths obtained from the dried extracts of meat, called portable soups; and from the results, as well as from common experience, it may be inferred, that the most palatable and suitable broths or soups for convalescents, requiring great care as to delicacy of diet, may be obtained by soaking the meat for some time, at a low temperature, and setting aside the solution, to which should subsequently be added the stronger broth obtained by adding fresh water to the meat, and continuing the boiling; or palatable broths may be made with little delay by macerating the meat for a short time, in warm water, and adding jelly, previously prepared, in such quantity as may be advisable.*

From the Arcana of Science.

METHOD OF DESTROYING MICE, &C., IN THEIR LURKING PLACES.

M. Thenard, in 1832, submitted to the Academy of Sciences a plan for destroying noxious animals, when they have taken refuge in their hiding places. The instrument of destruction is sulphuretted hydrogen, which he had remarked to be peculiarly deleterious to animal life. Animals, when allowed to breathe the pure gas, fall down, as if struck with a bullet. Even when considerably diluted with atmospheric air, the effects are deadly. A horse dies in less than a minute, in air containing $\frac{1}{250}$ of this gas. A dog of moderate size is speedily killed in air containing $\frac{1}{1000}$, while a greenfinch expires in a few seconds, in air possessing $\frac{1}{1500}$ of sulphuretted hydrogen. Influenced by these facts, the French chemist proposed the employment of this gas to several individuals for the purpose of extirpating noxious vermin, but his suggestions being treated with indifference, he determined to put the method in practice by his own experiments.

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* From a report of M. Chevreul to the Royal Academy of Sciences, noticed in the Journal de Pharmacie; and translated in the Dublin Journal, No. 23.

His first trial was in an apartment infested by rats, which showed themselves occasionally during the day, and at night were actively engaged in plundering a chest of oats, to which they had access through an aperture of their own formation. The holes by which they retreated amounting to 18 in number, Thenard adapted to each of them in succession retorts capable of containing half a pint measure, by introducing the beak of the retort, and filling up the interval round its neck with plaster. Sulphuret of iron was deposited in the retort, formed from a mixture of iron filings, sulpher and water, and dilute sulphuric acid was introduced by means of a tube placed in the tubulure. The sulphuretted hydrogen was disengaged with great rapidity, and in a few minutes not a rat remained alive in the building. His next experiment was in an old abbey, where he was equally successful, and having opened up part of the wall he found many dead rats. He recommends the application of this method to the destruction of moles, foxes, and all animals which cannot be extirpated by the usual means. Thenard then gives popular directions for the formation of the materials required to produce the gas.

Mix 4 parts of iron filings, 3 parts flowers of sulphur in a mortar with a pestle. Place the mixture in a convenient vessel, and moisten it with 4 parts of boiling water, stirring it with a piece of wood or glass. Add gradually, afterwards, 4 parts more of water, and introduce it into the retort. Pour upon the mixture common oil of vitriol, diluted with five times its volume of water, and continue to add it gradually till the effervescence ceases. Should any of the gas escape into the apartment, and occasion inconvenience, it may be removed by dropping a little sulphuric acid upon bleaching powder. The holes should be closed immediately, to prevent the disagreeable effects of the putrefaction of the carcasses of the animals which have thus been destroyed.*

EFFECTS OF GYPSUM AS MANURE NOT LESSENED BY ITS EXPOSURE TO THE WEATHER.

To the Editor of the Farmers' Register.

Albemarle, May 26, 1836.

Volume 2, No. 10, of the Farmers' Register, contains some "inquiries and remarks on the effect of exposing gypsum to the weather," with your reply thereto. Having made the inquiries, I feel it my duty to report the result of my experiments, with the gypsum which was the subject, of them—and have the pleasure to inform you that it is entirely satisfactory, and corroborates your own views in relation to the gypsum, to wit: "that it was not altered in its chemical character, nor materially injured," by the causes mentioned. It had sustained a tour of the seasons—had been under water several times, in a partially pulverized state, on the margin of James River, and when I moved it from thence, was hard frozen in the hogsheads. The lumpy parts were easily reduced to powder, by beating in a trough, with wooden pestles, rendered the more so, no doubt, by the transitions of weather, through which it had passed. The ensuing spring, it was applied to wheat and clover, in the usual manner, and upon corn, after it came up. In the latter case, the effect was very distinct at the distance of 300 yards, on the 4th of July, and the rows counted, (*after dinner too,*) by gentlemen who were not informed in what part of the field to look for them.

The effect on clover is equally apparent at this time, and is proven by beds left unplastered through the field in different parts. On these, the clover is thin, and of a pale, sickly hue, whilst on either side, it is a luxuriant mowing crop. One experiment was made, with a mixture of ashes, in the proportion of one half; here the deficiency of plaster is visible. But the most striking and valuable part of these experiments, is the effect of plaster on top-dressing. Several adjacent beds were top-dressed, with half-rotted stable manure, and one of them unplastered; this exhibits but little improvement—its neighbors showing a very high degree of it. This, I know, is nothing new; still, I believe there are many farmers so extravagant as to practice top-dressing without plaster. All these experiments establish the stimulating property of gypsum, which, by a mysterious action upon the organs of the plant, imparts vigor to its growth. Here, I take it, some inherent quality of soil is a necessary principle. The last decides its quality as a septic, and it is in this mode of its action, I presume, that its absorbent power is useful. This power would be of but little value, I imagine, without the subject for it to exert itself upon, no more than the evening dews. To the young experimentalist, it is extremely discouraging to be told that there are certain soils to which the God of Nature has denied the aptitude for gypsum, that "sweet restorer:" but how ought his hopes to revive, to know that its action is alike upon leaves, straw, stalks, and all putrescent substances; which at last are the *media* of all permanent improvement. So far, all may have its beneficial effects; and, so far, I feel authorized to add my testimony to the present mass, that the cost will be repaid, with handsome profit, upon any land.

C. H. H.

From the Horticultural Register.

REPORT MADE TO THE SOCIETY FOR THE ENCOURAGEMENT OF NATIONAL INDUSTRY.

By Mr. Soulange Bodin,

IN THE NAME OF THE COMMITTEE OF AGRICULTURE.

On an experiment in breeding silk-worms, made, in 1835, *by Mr. Camille Beauvais, on his estate of Bergeries de Senart, near Montgeron, in the department of the Seine-et-Marne.*

Gentlemen: You have referred to your Committee of Agriculture, the examination of a letter, which was addressed to you, on the 20th of June last, by Mr. Camille Beauvais. It calls your attention to one of the most important subjects of agricultural and industrious economy which interests the age in which we live.

Indeed, gentlemen, among the thousand various branches of industry, encouraged and rendered fruitful by your institution, a certain number of which gradually attain perfection in each year, and which you are anxious to verify, reward and render profitable to all, there cannot but be perceived the favorable indications and anticipated results of that great phenomenon, which characterizes modern society,—*Progression.* Every thing advances and is elevated, under the same secret impulse—individual benefit, towards the same apparent end—the public good; and in this universal movement, which is governed by an exalted philanthropy, each receives quietly, in his turn, the reward of his efforts, under the common banner of circumspect emulation, which neither contains, or occasions the least germ of dissention, or active opposition.

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* Annales de Chimie, translated in Thomson's Records, No. 1.

But it is different, when one of those bold, exclusive, and innovating ideas, which are occasionally advanced, by ardent minds, and whose natural enthusiasm is sustained by profound conviction, which astonishes the multitude, and tends to displace some ancient order of things. These commanding ideas, necessarily, disconcert inveterate habits, as to the correctness of old opinions, and excite against them precedents, which are enveloped in the legitimacy of time. A conflict of opinions is then produced, during which the human judgment long combats natural facts, and truth, on whichsoever side she may preponderate, will, sometimes, be very dilatory in her triumphs.

It is, gentlemen, a spectacle of this kind which is now offered for your consideration, by an able agriculturist, who has established himself within a few years, near Paris, on an indifferent, refractory and arid soil. It has been said, that this man only wished to put his foot upon our land; that to advance, he calculated but little on the profits of the plough, and that he only sought a spot, where he could realize the treasure, which, as yet, existed, but in his head.

This treasure, which Mr. Camille Beauvais now offers to your inspection, was not, in fact, gentlemen, but an abstraction, which he could thus have stated:

"To lay the foundation of his own fortune and increase that of the nation, by an improvement, which will certainly promote the cultivation of silk, in the centre and in the north of France."

After many experiments, he believes, that he has, at last, caused a new fountain of private and public wealth to arise, out of his own arid land, and far from desiring to engross it, for his exclusive benefit, he invites us to draw from this fountain, which will be inexhaustible, if his zeal for the public good, has not greatly deceived him.

Mr. Camille Beauvais belongs to the South: he had only to establish his magnanery* in the South, and to manage it, in conformity to the system with which he was already familiar; he knew the efforts which had been vainly attempted in preceding ages to breed silk worms in the North. Every thing attracted him on one side, while all was repulsive on the other; but he said to himself:

"Every branch of industry is advancing; why does that of silk always remain, very near what it was, when it passed from Italy into France? The sciences, as physics and chemistry—the recent discoveries in which have been so remarkable, and whose aid can be invoked, were then scarcely known to the husbandman; why then should this branch of industry remain irrevocably confined to its ancient cradle? Should the losses, which have sometimes been so discouraging, be attributed, rather to the constitution of the precious insect, by which this culture is maintained, than to the insalubrity of the situation, and the variations of the atmosphere, which have such a powerful influence upon a life, at the same so full and so brief? They cannot be imputed to the north, where the silkworm is not now bred, when they so cruelly afflict the delightful climate of the south, which is reputed to be exclusively propitious to them.—Wherever the mulberry tree grows and prospers, the worm which feeds upon its leaf, ought to be able also to grow and prosper. Do not perpetually neglect the accidental conditions of beings! Why cannot I create, under the shelter, where this worm accomplishes its destiny, an isolated climate, free from all local influence? I can, in fact, more easily protect them from the less sudden changes of the intemperate climate, of the north, than they can be screened from the capricious temperature of the south. What do I say? There is no longer either north or south; for I perceive that it is possible to command and combine, in their confined asylum, fire and water—those two great promoters of all organizations, and to imitate for them those winds, which maintain without, the salubrity of the air, and scatter to a distance deleterious effluvia."

I have put these words in the mouth of Mr. Camille Beauvais, gentlemen, not to extol or overestimate his theory, but because they express the bold and profound thoughts, which must have presided at his establishment, and contain the principles upon which all his labors were prosecuted. It was at his own expense, and his own risk, that, under the influence of his own convictions, he, for seven years, put these principles in practice, with continually increasing results, without being discouraged by a few mistakes which he nobly confessed without being intimidated by the inquietude of his friends, or the doubts which he saw arise, like clouds, ready to obscure the brilliancy of his first successful experiment, and to blast, perhaps forever, his fondest hopes.

It would be superfluous to enter, here, into the general details of cultivation, which every friend of agriculture is invited to examine, at the establishment of Bergeries. They have been described elsewhere; and that is not now the subject of inquiry; it is sufficient to say, that it is upon 67,000 mulberry trees, of the best species, and of the most luxuriant growth, among which are to be seen a great number of the Morus multicaulis, that Mr. Camille Beauvais principally founds his hope, of a second annual brood of silk-worms, which he proposes to undertake. These trees, including nurseries and established plantations, contain sixteen hectares and a half of land.

The establishment, in its present condition, is capable of rearing annually the number of silkworms which are produced from one hundred and fifty ounces of eggs. During the five last years the mean product of an ounce of eggs in the establishments of the south, has not exceeded from fifty to fifty-five pounds of cocoons, that is to say, only about 10,000 silk worms out of the 42,000 eggs, which an ounce contains, reached that last period, which unites a simple worm to the enjoyments of a refined civilization. On the contrary, Mr. Camille Beauvais' first brood, gave him sixty-seven pounds of cocoons, for each ounce of eggs. He has been constantly progressing, during the years 1830, 1831, 1832 and 1833; in 1834, he obtained 104 pounds of cocoons. All these facts are generally known. His last brood gave him 137 pounds; this brood was from eight ounces of eggs, and the worms were kept in a temperature equal to from 18 to 20 degrees of heat according to Reaumur's thermometer—[equal to 72 and 77 of Farenheit.] They continued their labors for thirty-seven days, and consumed 16,830 pounds of leaves, the product of trees, half of which were grafted, and the other half seedlings. They yielded 1,101 pounds of cocoons, of the most beautiful quality, large, firm, and of an admirable whiteness. It does not appear, that such a result has been obtained anywhere else, in any large establishment; nevertheless, Mr. Camille Beauvais, is the first to inform you, that one of his pupils, Mr. Henry Bourdon, who had recently left the Polytechnical School, and is a proprietor at Ris, terminated an experiment, in which the proportional product, amounted to one hundred and seventy pounds of cocoons, to an ounce of eggs.

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* The name given to the apartment in which silkworms are bred.

We have seen that an ounce of eggs produces 42,000 worms; Mr. Camille Beauvais employed eight ounces of eggs; he should, therefore, have had 336,000 silk-worms. He actually realized 1,102 pounds of cocoons; it requires, at Bergeries, but 360 cocoons to make a pound; he has then obtained only about 286,520 silk-worms. He lost 4,000, when they began to rise, to form their cocoons, by the bad arrangement of the heaths, or twigs, and an imperfect ventilation. He has then lost in the first ages, including the eggs which did not hatch, 45,480.

It results from an analysis, which Mr. D'Arcet has been so kind as to communicate to me, that the air of the magnanery of Bergeries, during the fourth age was slightly alkaline. The water, which was there condensed, by means of a globe filled with ice, and which was found to be as limpid as distilled water, was slightly alkaline. The nitrate of silver did not form a precipitate at the moment of admixture, but it immediately after assumed a faint brownish red color. At this period of the brood the ventilation was well regulated. The air was so little altered, that it was difficult to discover carbonic acid upon the tub of water, and ediometrical experiments made with this air, either by phosphorus or deutoxide of azote, indicated as much azote and oxygen as the atmosphere; it contained very feeble traces of ammonia, combined with carbonic acid.

At the period the worms began to ascend. the ventilation, as has been stated, was interrupted and in part suppressed, by the heath; the air of the magnanery ceased to be pure. Mr. Henry Bourdon, who made the analysis of the air, found it to be composed of

Azote and carbonic acid	82,57 parts
Oxygen	17,43
	100,00

It is known that atmospheric air contains 79 parts of azote and 21 of oxygen. It is apparent, then, that the air had become very much vitiated. At this period the water in the magnanery, and which was condensed, by the means of ice, was limpid; it had neither odor, nor savor, was alkaline, and not rendered turbid by the addition of nitrate of silver; but almost immediately assumed a faint brownish red color, and that there was suddenly formed, an abundant brownish red precipitate, which did not appear to have been perfectly defined.

An opinion can be formed of the effect produced on silk-worms, which are constantly confined in the magnanery, which is not properly ventilated, by the following experiment, which Mr. D'Arcet made upon some which were reaching their last state, and which were bred in a pure air; he confined twelve large silk-worms taken in their fourth state, in a quart bottle, in which had been placed some mulberry leaves; at the end of twenty-four hours, the air contained in the bottle had diminished in volume, was alkaline, and contained,

Azote	79,11 parts
Carbonic acid	17,50
Oxygen,	3,39
	100,00

The air, therefore, in the bottle, was almost completely vitiated, one of the worms was dead; the others were shortened and shriveled, and of a dirty greenish yellow color, and scarcely moved; three died soon after being placed on fresh leaves; the eight others ate but little, three only made a small quantity of silk before they died, two changed into the chrysalis state, without spinning, and three died without spinning or changing.

I have before stated, that Mr. Camille Beauvais should have had 336,000 silk-worms, from his eight ounces of eggs. He then realized from one hundred eggs only 85,27 cocoons, and lost 14,73 worms and eggs, which did not hatch. By adding to the 286,520 worms which spun, the 4000 which died, at the time of ascension, we have 290,520, which completed their growth. These worms consumed 16,830 pounds of leaves. Fresh leaves contain, of

Dried vegetable matter	32 parts
Water	68
	100

Each silk-worm, then, had eaten, in the whole course of its life, 29 grammes of fresh leaves, or 6,28, g. of dry vegetable matter.*

I have, gentlemen, pronounced the word *Pupils*. Mr. Camille Beauvais defines himself to be a man of conviction and progression; but that conviction, that progression and his ardent and disinterested zeal loyally seeks to establish an empire, an extension, in which their influences shall indefinitely increase. To attain that object, he has gratuitously opened a school of theory and practice, whither resort the young proprietors from all parts of France. This year they hurried—that is the word, to his establishment, to the number of fifteen. Among them are to be found, with Mr. Henry Bourdon, the pupils of Roville, the Marquis Amelot, a large proprietor in Gatinais, the son of Baron Mallet, who has an extensive sugar refinery at Choisy-le-Roi, Mr. Bella, son of the director of the model-farm of Grignon; Mr. Baynard, late prefect of the Haute-Alpes, and of Maine-et-Loire, who is now establishing mulberry plantations near to Bergeries. After having employed a part of their time, in attending to the breeding of the silk-worms in all its minutest details, and assisting with their own hands, in the cultivation and management of the mulberry tree, under the direction of a nursery man of the south, who is attached to the establishment, their worthy master assembles them, for two hours in each day, for the purpose of instructive conversation, when they recapitulate, or compare all the observations of the day, or discuss all the advantages, which, from their elevated point of view and their social condition, they are enabled to perceive, their country will derive, from the interesting subject of their studies and experiments. What truly logical ideas, what lights without shadows, what germs of amelioration, rendered fruitful by this powerful reconciliation of observations and facts, have already been produced by those young and studious citizens—the legitimate hope of Agriculture and the State! To present to you, gentlemen, in a single word, their deep conviction of the advantages they have gained, from their connexion with Mr. Camille Beauvais, and the sentiments, which his generous attentions had excited in their hearts, I should inform you, that before their departure, they unanimously voted to present him a gold medal, as a brilliant testimony of gratitude, the most sensibly felt and the most worthily merited. This medal has been struck at Monnaie, but the resolution is yet unknown to Mr. Camille Beauvais. A great number of persons have already made application to him, to be received at his establishment the approaching season.

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* Mr. D'Arcet has ascertained, that there are 5,58 parts of azote in 100 parts of the dry vegetable matter of the leaves. A silk-worm, then, does not find in all the leaves it eats during its whole life but 0,518, g. of azote. Silk contains 11,33 parts of azote in 100.

One of these pupils, Mr. Peycams, nephew of Mr. Caussade, Col. of Artillery and proprietor of an estate in Guadaloupe, has paid particular attention to the management of the *filature*. He is going to that Island, at the request of the principal planters, to instruct the black females, in the reeling of silk, from the cocoons; for this purpose, he will take with him the complete apparatus for a *filature*. But Mr. Camille Beauvais acknowledges, and has published in terms which at the same time delineate his character, his gratitude and his love for truth, that for the pleasing results which he has obtained this year, and which were chiefly produced by his own intelligence, the lofty reach of his genius and his determined perseverance, he is incontestably indebted to the apparatus for ventilation, which Mr. D'Arcet has already made known to you, which was applied to Mr. Grimaudet's very complete magnanery, and the plan and description of which, the Society for the Encouragement of National Industry has published in its *Bulletin*, under the name of *Salubrious Magnanery*, which Mr. D'Arcet had given to it. After various experiments, Mr. Camille Beauvais says, this simple and cheap apparatus has finally proved, what he had conceived might possibly be attained, and what he had for a long time sought; *an equal temperature and a pure air constantly renewed:* conditions, which joined to careful attention and cleanliness, approximate as nearly as possible, the artificial breeding of silk-worms, in those limited apartments, where it is necessary to confine them in Europe, to the most favorable condition in which they have been placed by nature.*

The first application of Mr. D'Arcet's system of ventilation, at the establishment of Bergeries, has, at once, imperfect as must yet be an operation, which, for want of time, could only be considered as an experiment, had a success, which cannot fail to interest every enlightened mind. God forbid, that what remains for me to say, should diminish the merit of the applicator, and his right to your respect! On the contrary, Mr. D'Arcet has himself declared that it was Mr. Camille Beauvais, who communicating to him an opinion which that learned man had formed in travelling through the south of France, on the culture of silk-worms, and had requested him to consider the subject, and make a plan of a magnanery. French agriculture will please then, I hope, to unite in the same sentiment of esteem, the learned and the practical man. I say French agriculture, for it should not be doubted, if the interesting experiment which has been submitted to your consideration, should have such an important influence on the production of silk in the central and northern parts of France, how much more efficacious still, will it be in ameliorating the culture of the South! Will not the most cautious men—those ancient agriculturists, who have so great a right to intrench themselves behind that prudence which we respect in them, and which is the treasure of their life, wish at least, that such experiments be repeated and extended? But the subject is so important, and the inquiry so grave, that I request, gentlemen, your permission, to enter into some details, previous to presenting a short summary of the essential conditions, for the proper management of silk-worms, and the means which are now employed, to render the air of the magnanery salubrious.

If the organization of the silk-worm is carefully examined, and it is found that they respire only by their stigmata,† and if the gas they expire, especially during the period of their last change, is analyzed, no one can fail of being convinced of the importance of a gentle and continuous circulation of air, in an apartment where millions of these little insects are assembled and extended on frames which emit deleterious exhalations.

On attentively observing the continual exertions which are made by these small animals, both by dilation and contraction, and which are repeated without cessation, especially at the moment of moulting, it will be seen that all their functions are in operation with greater or less activity, according to the heat, to which they are subjected, and it will be readily perceived to what danger they are exposed, from sudden changes of weather.

Great humidity in the magnanery is of itself fatal to silk-worms, while it produces a fermentation in the vegetable and other matter which collects on the frames where they are fed, and thus vitiates the air they breathe; therefore, cultivators dread, especially in the fifth state, the cold and damp winds of the south. Besides the exterior humidity, a great quantity is developed in the magnanery, from the leaves and from the worms themselves.

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* There is in China, a wild species, which feed in the open air on the mulberry trees of the country, and which have not yet been domesticated.

† The silk-worm, and the larva of other insects, instead of breathing through the mouth, like other animals, breathe through the spiracles or stigmata, which are holes in the rings on each side.

The dryness of the air, besides being essentially injurious to silk-worms, as to all other animals, even when in the greatest possible purity, withers and crisps the leaves; and the worms, instinctly perceiving that they require a certain quantity of water in their food, reject the leaves as soon as they wither; there is consequently the suffering of the worms, as well as the loss of leaves.

All intelligent cultivators know, from their own experience, how important it is to fulfil all the conditions of a continual renewal of the air, a uniform temperature, and an invariable humidity; but from a want of the means for doing this properly, they are compelled to guard against the injuries which may arise as well as they can, and to this end, they are in the habit of burning in the apartment aromatic plants, boiling vinegar with cloves in it, sprinkling the worms with chloride of lime, &c. &c. But the inefficiency and even danger of these expedients is readily perceived.

Dandolo, the distinguished cultivator of Piedmont, delayed not in ascertaining that these means were detrimental to the silk-worms, and immediately and completely reformed the art of managing his establishment. To purify a magnanery, he made holes in the floor, ceiling and lateral walls, for the admission of fresh air, and the escape of these fumigations, which he had ascertained were dangerous; and in the magnanery, constructed on his plan, and called *Dandolories*, the proprietor obtained from 100 to 110 pounds* of cocoons, instead of from 50 to 60 for each ounce of eggs; but his imitators, unfortunately, are but few, in consequence of the want of encouragement in Piedmont. Here is the subject presented for consideration in France, where encouragements are not wanting.

Nevertheless, the system of Dandolo is yet defective; he established his fireplaces or furnaces in the magnanery, and the immediate action of the heat which is developed, and the exhalations which arise from the combustibles, cannot but be injurious to the silk-worms. Besides, his means are often ineffectual, especially in lowery and stormy weather, when the air does not freely circulate, and when it is necessary to have recourse to fumigations of chloride of lime, the application of which it is far from being practicable at all times to make, with the desirable exactness.

It is necessary, then, to employ more powerful and infallible means, for illustrating the principles of sanitory purification developed by Dandolo: it is thus that science assumes its control over the subject, and completely annihilates the action of exterior influences, removes the source of heat beyond the magnanery, and is enabled to realize, simultaneously, the four conditions so essential to success in the management of silk-worms.

In the system of D'Arcet, the magnanery is in the second story, and the furnace or calorifery, is in a small apartment in the lower story, which is called the air chamber. The air issues from this chamber into pipes, which extend the whole length of the floor of the magnanery, and from which it issues through circular holes of various sizes. In the ceiling, are made a number of conduits and openings, perfectly symmetrical with those below, and it is by these superior openings that the air escapes through a funnel into the chimney of the furnace, which receives the pipe of the calorifery, after having been introduced into the magnanery, by which a continual warmth is kept up.

It is only necessary, then, that a proper temperature and humidity should be maintained in the apartment; and this result is easily obtained, for, by the aid of a furnace, ice, moist cloths, and diseccating substances, there can be produced heat, cold, humidity and dryness.

In the month of April, 1833, Mr. D'Arcet sent to Mr. Camille Beauvais, his plans of a "Salubrious Magnanery," and as the period of breeding the silk-worms was near, the application of the system and a knowledge of the result, would be postponed for a year if it was suffered to pass, Mr. Camille Beauvais was impatient to test this scientific theory by an experiment, the success of which was guaranteed by his experience in the management of silk-worms. In a month he constructed a new magnanery, which was so judiciously arranged, as to insure to him all the advantages which could be derived from the proposed improvements. He corrected, as soon as possible, such imperfections as necessarily arose from the novelty of the system applied to the rearing of silk-worms, and the precipitate manner, in which the work was executed.

Mr. Camille Beauvais, immediately found in the interesting and successful result which he obtained, the prize of his assiduity and his devotion;* and has the gratification of having demonstrated more clearly than had before been done, that a new era may be commenced in the culture of silk—thanks to Mr. D'Arcet's system of salubrity, for the application of which, it only requires a careful and attentive workman to execute the instructions which he has given, in a perfect manner.(1)

Still, gentlemen, if the important fact which has been established near the capital of the empire, seems to countenance those bright hopes which numerous enlightened men have entertained, it is proper to declare—it is proper to repeat, in the sincerity of truth, which repulses all equivocal triumphs, that whatever confidence this remarkable experiment merits, and has already obtained, it only appears as yet but as an isolated and very recent result, and is at present deprived of that influence, which can only be obtained by its reproduction by different persons, under other circumstances and in other places, and it should also receive the sanction of time. The author of this experiment merits encouragement without doubt; the attention of those who are interested in it ought, at the same time, to be roused, and possibly restrained; new trials appear desirable to the true friends of our prosperity—that is to say, gentlemen, to you all, it is important that those trials be continued, for that which attracted your attention, has also attracted the attention of the able cultivators of the South—strangers to all prepossessions, superior to all prejudices, they await new trials with an eagerness the more legitimate, because they well know, that the experiments which are now making in the North, cannot but be advantageous to the South, which is ready to receive with gratitude new methods of culture which appear to them sufficiently well tested; they know that the industry on which large fortunes are founded in the South, will be able without injuring them, to create like fortunes in the North, and gradually relieve the common country from the tribute of forty-five millions of francs, which it annually pays to foreigners for raw silk; and which the agriculturists of the North, hereafter the emulators and not the rivals of those of the South, will be able, in a quarter of a century, to divide with them, as brothers, the ever increasing fruits of their own industry.

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*The pound of 16 ounces.

*The current price of raw silk, was at that time, twenty-five francs per half killogram, and Mr. Camille Beauvais sold his for fifty. It was produced by that beautiful race called *Sina*, which Louis XVI. obtained from Canton in 1784, and was by degrees changed, in consequence of the negligence and avarice of the first cultivators of this species of silk-worm; but Mr. Poidebard has been enabled, by long and assiduous efforts, to regenerate it in a remarkable manner, and Mr. Camille Beauvais has endeavored to restore it in all its primitive beauty.

(1) It is highly probable, that the apparatus for heating green houses with hot water, or the cockle or furnace for warming private houses and public buildings, may be advantageously substituted for Mr. D'Arcet's method. If the theory of Mr. Beauvais should be deemed worthy of adoption in this country, the ingenuity of our enterprising citizens will, beyond a doubt, discover some simple, cheap, and better mode. —*Translator.*

From these various considerations, gentlemen, your Committee on Agriculture has charged me with the honor to propose to you, that this report be inserted in the Bulletin, and referred to the Commissioners on medals.

Approved, at a meeting held on the 30th of September, 1835.

SOULANGE BODIN, *Reporter.*

Extracts from the Journal of the Franklin Institute.

LIST OF PATENTS ISSUED IN OCTOBER, 1835, FOR IMPROVEMENTS OF MACHINES, &c. TO BE USED IN AGRICULTURE.

With remarks, by the Editor of the Journal of the Franklin Institute.

For a machine for *Thrashing and Cleaning Clover or Rice;* Moses Davenport, Phillips, Somerset county, Maine, October 6.

The machine here described consists of a long trough, containing the feeding, rubbing, and other apparatus. It is too complex for verbal description, but its characteristic feature appears to be, the passing of the seed between rubbing boards, covered with perforated metal, or otherwise made rough, the lower board being stationary, and the upper one, as it vibrates, bearing on the seed in one direction only, it being raised in the return stroke.

For an improvement in the mode of *Rearing Silk Worms;* Gamaliel Gay, Poughkeepsie, Dutchess county, New York, October 6. (See specification.*)

For a *Chaffing Thrashing Machine;* Russel Bradley, Williston, Chittenden county, Vermont, October 6.

We cannot afford more lines to this apparatus than there are pages in the specification of it. The unthrashed straw is to be laid lengthwise in a feeding trough, where it comes into contact with a revolving cylinder, carrying circular saws, at short distances apart, serving to cut the whole into chaff; it then descends to a thrashing cylinder, and thence passes through a winnowing machine of the ordinary construction. The claim is to the application of the circular saws.

For a *Plough;* William Walker, Washington, Columbia county, Pennsylvania, October 6.

The claim is to "the peculiar formation of the sheath, or standard, and the projections on the inner side of the mould-board, which give them sheath, or standard, a leaning position, and cause the plough to take land."

For a *Horse Power;* Moses Davenport, Phillips, Somerset county, Maine, October 10.

The claim under this patent is to "the method of construction, or combination, by which the several parts of the jointed platform are put together; of the cylinder heads, and of friction rollers." This combination in most of its parts, exists in numerous other endless platforms; the peculiarities of the one before us, ought, therefore, to have been pointed out, as upon these alone could any valid claim be founded.

For a machine for *Hulling and Cleaning Clover and Timothy Seed;* Asa Burgess, and Herman Baldwin, Washington, Litchfield county, Connecticut, October 10.

Ten pages are devoted to the description of this machine, but our remarks upon it will be as brief as the specification is prolix. The feed is to be regulated by sliding boards, not differing essentially from such as are already in use. The seed is to be rubbed out by a revolving cylinder, furnished with points, or teeth; and below this there is a fan, so enclosed and constructed as to blow the chaff and dust away, without annoyance to the operator. The claim is sufficiently comprehensive, extending to many points in its construction, and also the situation in which it is placed in a building, for the purpose of blowing the chaff entirely out of it.

For a *Gravitation Churn;* Asahel Bacon, Windsor, Broome county, New York, October 10.

There is to be a weight wound up as a maintaining power to a pendulum, a train of wheels and pinions to regulate the same, and there is a claim to "the propelling of vibrating or dasher churns, by means of a weight, or weights, attached to a gearing of cog, belt or band wheels, or all of them."

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* The specification of the improvement which is given afterwards at length, describes merely one or more revolving aprons of cloth, something like those of net work, which are sometimes used to convey the straw from a thrashing machine—these being to work under the hurdles on which the silkworms feed, and to convey away the litter which falls through. To our humble comprehension, it seems unaccountable why this invention should have passed without a sarcastic comment from the editor, or why the specification of so trifling a matter should have been afterwards inserted in full.—ED. FARM. REG.

For a *Turning Lathe, to turn Rake Staves, Hoe Handles, &c.*, James Haven, Newport, Sullivan county, New Hampshire, October 14.

If there is any thing really new in this lathe, the patentee has not enabled us to discover it; the object proposed, that of varying the form of the handle, or other article turned, according to a pattern, is a thing well known. The specification, without the aid of a good drawing, is insufficient for the intended purpose; and that which is called a drawing serves only to "make darkness visible." At all events, a lathe, which would turn such handles most perfectly, may be constructed without violating the rights of any one.

For a *Plough;* Junius S. Tefft, Amherst, Erie county, New York, Octeber 17.

The claims are to "the manner of constructing and using the standard; of applying the landside plate, and the general combination of the parts."

For a *Machine for Propelling Machinery;* David Russell, Tuscumbia, Franklin county, Alabama, October 27.

This is called "Russell's Power Motion Machine," and we suppose that it is intended to gain power, in some way, but how, we are not told, and cannot discover. A circular platform of wood, which is a flat ring, two feet wide ,twenty in diameter, and four inches thick, rests upon steel springs; upon this platform, a heavy wheel is to roll, having a horizontal shaft geared into a vertical centre shaft, in the manner of some bark, drug, and other mills. The magic is, no doubt, in the springs, but we have no seer by us to unbind the spell.

The *combination and arrangement* are claimed, and we are told that "this machine may be used to propel all kinds of machinery, and may be propelled by steam, horse, water, or manual power."

For a *Portable Saw Mill;* David Russell. Tuscumbia, Franklin County, Alabama, October 27.

Strange as it may seem, this portable saw mill, although invented by the patentee of the *machine for propelling machinery*, is to be driven by a horse, geared to a shaft, in the usual way. A frame is made, which is to be moved about upon wheels, and is to sustain the various parts of the mill, which has nothing peculiar in its construction, excepting it be that the saw is not to be strained in a frame, but the upper end of it is to be acted upon by springs, which are to aid in raising it, in conjunction with the operation of the crank at its lower end. Respecting the use of springs, we refer to No. 8, p. 327; this application of springs is not claimed, nor, indeed, is any thing, excepting "the combination and arrangement of the several parts," which, when there is no novelty, is a convenient mode of slurring the matter over.

For a *Cotton Whipper;* Lucian Osgood, Pomfret, Windham county, Connecticut, October 27.

"What I claim as my improvement, and by which the whipping machine for cotton is facilitated, and rendered more effective than heretofore, is the placing the whip shafts of such machines obliquely, so as to form an angle with the horizon, of twenty-five, or such other number of degrees as may be preferred."

For an improvement in the *Machine for Hulling Cotton Seed;* Anderson Miller, Washington county, Mississippi, and Thomas Laws, Jefferson county, Kentucky, October 27.

This machine is said to be an improvement upon that of Follet & Smith, but the whole arrangement of it is described, without any attempt being made to distinguish between the improvements, and the original machine. Much stress is laid upon the frame being of cast-iron, the gudgeons running in brass boxes, and all the parts of the machine being firmly made; there is also an eccentric roller described, by turning which the feed can be regulated. It should be recollected by the patentees, and purchasers of machines, or rights, that, excepting under the authority of Messrs. Follet & Smith, there can be no valid conveyance of the improved machine, any more than there can be of my house by a tenant, because he has improved it.

For an improvement in *Making Ploughshares and Coulters;* Samuel A. Sperry, Ann Arbor, Washtenaw county, Michigan, October 27.

The iron is to be rolled, as nearly as may be, into the proper shape; it is then to be converted into steel, and the shares, or coulters, are afterwards to be forged into such forms as may be wanted. The right to do this is claimed, which claim is one of a very questionable character.

For a machine for *Crushing and Grinding Corn;* Anderson P. H. Jordan, Madisonville, Monroe county, Tennessee, October 28.

The crushing to be effected by a twisted bar of wrought iron, operating like that described by Oliver Evans, as used in mills for grinding plaster of Paris; from this twisted bar, the corn is to pass between a conical nut and shell, of the ordinary form. "The improvement consists in the uniting of the nut to the twisted bar, and upon this union the patent is claimed;" a union which may very well be dispensed with.

For a *Horse Power;* Asa Trahern, Henry Heberling, William E. Lukens, and John Heberling, Short Creek, Harrison county, Ohio, October 28.

This horse power is of the well known kind in which the animal, walking in a circle, is geared to a lever extending from a vertical shaft; at the lower end of this shaft is a crown, or bevil, master wheel, gearing into a pinion, or wallower, on a horizontal shaft, even with the ground. We cannot find any thing new in the affair; but the patentees claim "the eye of the master wheel and shaft, and the moving pinion, by which means, wood, pot metal, and iron, and consequently, cost, are saved, and its utility greatly increased, whilst it is rendered much more portable." We are told that the master wheel "has a round eye, and runs on a round shaft." And the pinion by which the power is communicated at the outer end of a horizontal shaft, runs in a frame which may be moved round, so as to cause it to stand on any part of the periphery of the wheel which drives it.

These, we suppose, are the things intended to be claimed by the four improvers of the horse power.

For a *Hill Side and Horizontal Plough;* John W. Jordan, Lexington, Rockbridge county, Virginia, October 28.

The claim made is to "the *combination* and *arrangement* of the parts of the described plough, but particularly the *form* of the mould-board, and the manner of reversing it, though no claim is made to the principle of revolving mould-boards," As respects "the *form* of the mould-boards," it is said to resemble "two mould-boards of the M'Cormick pattern, (a right and a left hand,) united by their upper edges." There are numerous points of detail, showing, by reference to drawings, the particular manner in which the patentee constructs and connects the various parts of his plough; but nothing which bespeaks it superior to other hill-side ploughs, many of which have been patented.

From the Quarterly Journal of Agriculture (of March 1836.)

THE CULTURE OF ASPARAGUS.

By J. Towers, Author of the Domestic Gardener's Manuel, &c.

Asparagus is a native of the sea shores of Britain, though, according to Dr. Hooker, it is rarely found in Scotland: it is worthless in its native original state, but, as every one knows, is susceptible of the greatest improvement by culture, and becomes highly luxuriant in a richly manured, light, and mellow loam. The young sprouting stems, as they emerge from the soil, are used for the table; and these, if suffered to grow, and become fully developed, form one of most graceful among the productions of herbaceous vegetation: the numerous branching lateral stalks, produce innumerable tufted, minute leaves, of the most lively and delicate green; at the angles (*axillæ*) of the smaller branches two or three pendulous flowers are situated; they are greenish, bell-shaped, and without any particular odor. Each flower consists of a calyx of six deeply cut segments—six stamens—one very short style, and its stigma cut into three divisions and a germen, becoming a scarlet globular berry, which contains one or more perfect seeds in its three cells. This plant forms, with others of the same genus, one of the families of the Asphodel tribe, *Asphodeleæ* of the natural system. How, and at what period, the plant was brought into cultivation, it would now be vain to inquire; but it appears probable that, in England, it was little known before the seventeenth century.

The modes of cultivation practised with a view to bring the vegetable to the highest state of perfection, in the different countries of Europe, are too numerous and complicated to be now alluded to, much less described. It will be my aim to point out two processes by which fine highly-flavored shoots may be abundantly produced. The one is not so much in fashion as formerly, but it possesses great conveniences; the other is more novel, and perhaps more scientific, as it may be made to comform to the hypothesis of radical exudation. The physiological reader will readily perceive, that, by adopting it, he can introduce other vegetables between every row of his asparagus, and thus avail himself of the nutritive matters which their radical processes yield to the soil: However, I shall simplify my directions, and confine them to the process of *forcing* early asparagus. These will be brought under one view in the succeeding notice of sea-kale.

Culture in Beds.—This is the method that has been adopted for a number of years, and recommended by most writers; but there exists great difference of opinion as to the way in which the beds ought to be formed. Much of the permanent success will depend upon the nature of the staple soil; and I hesitate not to say, that, unless the garden afford one which is light, loamy, and free from stones of any considerable size, to the depth of two feet at the least, the whole plot ought to be formed artificially, and the best material for the work is the thin turf of a meadow of short growing grass, or that of a common, where sheep abound. Such a soil is replete with vegetable, decomposable matters; and, in fact, is very suitable to the cultivation of every product of the garden, unless it be that of a few vegetables which prefer a stiff soil, or one of an entirely opposite description, and approaching to the nature of sand.

Turf may, however, prove a defective material, if it be produced upon clay or stiff loam; but, in in ordinary cases, that of a common, or sheep-walk is of a medium texture, and breaks down into a rich light earth, which, while it can be digged and pulverized with freedom, is also sufficiently compact in texture and retentive of moisture. If a store of turf, an inch and a half in thickness, could be readily obtained, I should prefer it to any other species of earth whatever. An asparagus bed is not the work of a day; if well laid out and properly planted, it endures for years, and repays any ordinary cost and exertions; but it would be better not to undertake it at all, than to perform it in an unskilful and slovenly manner. If the soil of the plot selected be already free to the spade, deep, and equable, it may be brought into a state nearly equal to good natural turfy loam, by the liberal addition of a well reduced and black leaf-mould. Having thus premised, I would recommend the formation of two beds by the process now to be described: the one will exhibit the progress of the plant from the *seed*, and perhaps will form the most perfect plantation; the other will come into full bearing at an earlier period, but not by any means so much so as many persons are apt to imagine.

Preparation of the Beds.—Select a piece of ground of about thirty feet long, ten feet wide, and open to the full south sun, so that its rays may fall in the direction of the length of the beds. Open a trench, two feet wide at one end, and wheel the earth to the opposite end, or rather to a spot two or three feet beyond it: this implies that the soil is good, otherwise it should be wheeled or carted away, to be employed for other purposes. Have ready, and close by the plot, six cart-loads, at the least, of well-wrought leaf-soil, sea-weed, or, in default of either, of perfectly good spit-dung. If fine turf be employed, one-half of the above quantity of the *enriching substances* will be sufficient. The first and every succeeding trench is to be digged and cleaned out at the bottom, to the depth of two feet or more, as the good soil may indicate. It has been recommended to trench four and five feet deep, with the assurance that a proportionably great and permanent crop of the asparagus would be produced. I have tried two feet, and thirty inches, and believe that a perfectly well enriched soil to that extent, will be more efficient than six feet of a dead, cold substratum. At all events, a good six-inch layer of rich manure should be laid at the bottom of each trench, and the first being cleared and so prepared, the soil and a due proportion of the manure are to be put into it, and mixed as equally as possible, till the earth be raised at least six inches above the old surface level. Thus the work is to proceed, trench after trench, until the entire plot be filled up with *thoroughly moved and incorporated materials;* the last trench must be filled with earth out of the first. At this stage of the work it will be found that the reserved earth will be insufficient to complete the plot: in order, therefore, to equalize the surface, it will be prudent to dig the bed again in a contrary direction after an interval of a week; and previous to this operation, I would recommend that about a gallon of common salt be regularly sprinkled over the whole surface; it will tend to bring the bed into that chemical condition, which a constant dressing of sea-weed would induce.

Having thus described the preparation of the bed, I observe once for all, that if turf be in plenty it cannot be made too deep; and this will hold good in the preparation of all garden plots where *vegetables alone* are to be grown. For *fruit-trees,* I believe that eighteen inches of pure maiden turfy loam, without one particle of animal manure, over a six-inch stratum of coarse stones, brick-bats, rocky fragments, or the like, would, be a more fertile medium of growth, and one infinitely more conducive to the health of the tree, than double the depth of a highly enriched garden soil. This digression will be permitted, as it includes a general remark applicable to culture in most departments.

The bed thus double-digged will be ready for cropping, and though it might be as well to have thus prepared the soil during the dry weather of the winter, it will yet be in good time if the work be accomplished during the month of March. After the ground shall have settled for a week, two beds, each three feet wide, should be marked out, and this width will admit of an alley between the beds, and one on each side of them, more than a foot in breadth. To form these, strain a line on the outside of the beds, and two down the middle space between them, so as to mark out the limits of the beds, throw the earth out of the alley upon the beds, that their surface level may be six inches above the base of the alleys. If turf be at hand, it would be right to place three inverted well cut turfs the whole length of the alleys, and thus to form good and solid walks; a dressing of salt should then be sprinkled over the turf to prevent the growth of the grass. Some persons use a deep layer of ashes; but whatever be the material employed, the beds ought to be raised a few inches above the walks, not, however, to provide for drainage, but to render the future culture convenient, and to give a finished appearance to the plantation.

Sowing Seed.—Early in April and in fine weather, stretch a line three times up and down the bed, by means of stakes driven into each end, exactly one foot apart, and the like distance within the sides; draw three drills an inch and a half deep, with the angle of a hoe, and make the bottom of each drill even, by pressing into it lightly a straight even pole, like the handle of a long rake. Scatter asparagus seed as regularly as possible along the drills, or if the the seed be known to be good, three or four seeds may be carefully dropped at inch distances, in spaces nine inches apart: the ultimate object is to obtain one good plant, at every space of nine inches, therefore the good sense of the gardener will guide him so to manage the seed-sowing, as to combine economy of seed and time with security of result. Bad seed taken out of very old berries may perhaps scarcely produce one plant from twenty grains, though the seeds will remain good for three or four years.

When the young plants germinate they should be permitted to grow to the height of three inches, or till the leaves become perfectly developed, and it appear which plant will prove strong. If two arise close together, one should be removed as soon as possible, by means of a flat, sharp-pointed stick, and the whole should be thinned out early, so that there may be a space of two or three inches between plant and plant. The spaces between the rows must be kept clean by passing a flat or Dutch hoe cautiously over the surface, and as the plants acquire strength, they may be thinned out to four inches apart; but it would be rather imprudent to attempt a more severe thinning-out during the first year, and till the winter pass over, as it will be impossible to decide to what extent extreme moisture of ground, frosts, snow, and other enemies, may prove destructive during the torpid season. If the plants stand the winter well, the supernumeraries may be employed to great advantage; but of the use to which they may be turned, and, indeed, of the treatment of the seed-bed during autumn, nothing need now be said.

Planting Asparagus Beds.—This is the method usually adopted, and plants two years old from the sowing are generally recommended. I believe that the age is of little consequence as far as security may be considered; and that three or four year old plants may be employed, when it is the object to obtain produce within the period of twelve or fifteen months. Yearly plants are safe also, and these may be planted four inches apart in shallow trenches, or open drills cut with a spade along lines stretched very tight, and at the distances mentioned before. The plants should be placed so deep as to permit the crowns to be covered with two inches of fine earth, and the roots ought to be let down to their full extent into the ground in a rather open and expanded order, and be perfectly coated, and in contact with the soil. Dry weather at the close of March, or early in April, should be chosen; because the earth, when it is in a free and open condition, may readily be made to fall among the stringy processes of the roots; but when planted, each row should be liberally watered once, to fix the plants securely, and to enable them to start into growth without any loss of time. The routine culture of the beds will be in all respects similar to that before described; and if blanks occur in consequence of the decay of some of the roots, they may be filled up with young growing plants, as late even as the middle of June; provided that each be raised from the seed, or nursery-bed, without injury, and be set immediately during cloudy weather, or in the evening, and copiously watered. The second method of planting, with a view to forcing, will be described hereafter. I defer any farther observations for the present, as respects the general routine culture, merely remarking that, from *seed-beds*, in carefully prepared ground, I have cut very good asparagus in two years, that is, in the third season after the sowing.

From the Farmer's Magazine.

METHOD OF ASCERTAINING THE RICHNESS OF MILK.

Many considerations render it a matter of great importance, in rural economy, to ascertain the richness of milk with facility and precision. The richness of this fluid depends principally on the quantity of oil or butter, and curd or cheese, which it contains.

The relative quantities of these valuable ingredients, in the milk of different cows, may be discovered, with an accuracy more than sufficient for all useful purposes, by ascertaining the specific gravity of the milk, in different states. The beads invented and manufactured by Mrs. Lovi, of Edinburgh, afford the readiest way of trying these specific gravities; and the method of using them is the following:

Pour fresh drawn milk into a glass vessel. and as soon as its temperature falls to the 60th degree, as shown by a thermometer plunged into it, discover, by trial, a bead which will remain suspended in any part of the liquid. For this purpose, first introduce number 24; and if it rise to the surface, remove it, and try 25; if it swim, try 26, and so on, until a bead is found which does not rise to the surface, nor yet sink to the bottom, but continues stationary in any part of the liquid. The number upon that bead denotes the specific gravity of the milk, and is to be carefully noted. A quicker way consists in throwing all the bends at once into a larger vessel of the milk; probably some will sink, and some swim. The one which remains suspended, indicates the specific gravity. If none be in that situation, then observe the last bead that swims; and the first which sinks, and the number intervening between them, is the specific gravity. Thus, if 25, 26, and 27 swim, and 28, 29, 30, &c., sink, 27½, which is the number intermediate between 27 and 28, expresses the specific gravity. *Next*, allow the milk to stand for 24 hours, or till all the cream has risen; after removing it, bring the skimmed milk to the temperature of 60°, and ascertain its specific gravity in the manner already described.

As the oil, which has separated in the form o cream, is the lightest ingredient, the specific gravity of the skim milk will be found greater than before; and the larger the quantity of cream, the greater will be the difference of specific gravity.

This difference, therefore, affords a sure indication of the relative quantities of oily matter or butter.

Thus, if entire milk possess a specific gravity of 29, and the skimmed milk, on one occasion, have a gravity of 35, but on another of 32 only, the difference, in the first case, amounts to six degrees, and, in the second, to three degrees; and the milk of the first example will afford nearly twice as much butter as that of the other, and so on, in every other proportion.

Or, if one milk at 30, have its specific gravity increased to 34, by the removal of the cream, and another at 28 rise to 32, then, as the differences are the same, the quantity of butter which they will afford, will be nearly the same.

In this manner, the relative quantities of oil, contained in milk, is discovered; and, to ascertain the proportions of the curd or cheese, curdle such a quantity of the skimmed milk as will afford a sufficient quantity of clear whey; then bring it to the temperature of 60 degrees, and ascertain its gravity.

As the curd is a heavy ingredient, the specific gravity of the whey will be found to be less than that of the skimmed milk; and the larger the quantity of the curd, the greater will the decrease be.

The difference, consequently, in the gravities, affords an indication and measure of the relative quantities of curd.

Thus, if skimmed milk stand at 36, and the whey in one instance at 32, and in another at 34, it may be inferred that the first will yield about twice as much cheesy matter as the second, and so in all other proportions.

It is most accurate to try the specific gravities of the milk, in all its states, at the temperature of 60. But, if any circumstance prevent this being done, and they are tried at any other temperature, then, for every four degrees of deviation from the 60th degree of temperatnre, make an allowance of one degree of specific gravity; and, if the temperature be above 60, add the allowance to the number actually found; if the temperature be below 60, deduct it.

Thus, if the milk possess, at temperature 68°, a specific gravity of 28, as the excess of temperature above 60° amounts to 8 degrees, or twice 4, make an allowance of two degrees on account of the temperature, and add them to the 28; consequently, 30 will be the number of expressing its specific gravity, at the standand temperature of 60°.

Again, if the trial be made when the milk is at temperature 52, and the specific gravity be found to be 32, make the allowance of two degrees, but deduct them from the amount found, and the remainder, or 30, will denote the specific gravity.

It has been found, from experiment, that the Beads applicable to the different kinds of milk examined, are the following.

Womens' milk, from	30 to 38
Cows	24 to 34
Asses'	34
Goats' (house-fed)	34
Cows's milk, when the cow was fed on grass, before being creamed, was 32; after the cream was taken off	40
The milk of ewes, also grass-fed, was 36 before it was creamed; and after the cream was taken off, it was	48
Mares' milk was found to be	36

Note.—It appears that womens' milk, and asses' milk afford scarcely any cream.

Advantages of the beads.

The advantages to be obtained from this mode of discovering the richness of milk, are so obvious as scarcely to require enumeration.

1st. It affords an easy method of estimating the value of a milch cow. By taking into view the quantity of milk, and its quality, the merits of the animal may be justly determined.

2d. It affords the best means of judging of the fitness of a cow, for a butter or cheese dairy.

3d. It affords ready means of trying the effects of particular kinds of food upon the milk of cows.

4th. It affords means of determining the value of particular pastures.

5th. It affords excellent checks upon the fidelity, as well as the skill and attention, of the dairy servants.

N. B. It is proper to observe, that these beads indicate the real specific gravities, and are made to speak the common language of science, by adding 1000 to each number; thus, a specific gravity of 30, as expressed by these beads, means 1030 in reference to the gravity of distilled water, taken as 1000.

From the Farmers' Magazine.

ON REAPING CORN [WHEAT] AT DIFFERENT STAGES OF MATURITY.

The reaping of corn at different stages of ripeness, has lately excited a good deal of discussion amongst practical farmers; and the subject is of so much importance that it is no wonder it should have done so.

An innovation upon long-established custom is seldom popular. And, from the history of fallow—the two-horse plough—the thrashing machine—and the scythe-hook—it would appear that there is something either in the existing state of society amongst farmers, or in the peculiarities of their profession, which renders the introduction of an agricultural change slow and difficult.

Although the utility of reaping corn before it attains full maturity has at present a host of opponents, yet, if it is founded upon just principles, it will ultimately prevail. Indeed, the practice has been slowly gaining ground for many years past; and it may be predicted, without pretending to the gift of prophecy, that the practice will soon become general in all our best cultivated districts.

The two principal objects to be attended to in the reaping of corn, are the quantity and quality of the produce; and, when endeavoring to point out the proper stage at which corn ought to be reaped, my observations are intended chiefly to bear upon these two objects, and, if possible, to connect them together.

As culmiferous crops approach maturity, their grains shrink and become hard, loose in the chaff, and apt to drop out upon the slightest agitation; the straw stiff, white, and sapless, with the ear curved towards the earth. And when these changes have taken place, the crops are said to be completely ripe; and in former times they were seldom reaped until arrived at this state of maturation.

In opposition to the ancient practice, a modern one is recommended, called green cutting, the advantages of which are numerous and important. The term green cutting, however, must be used in a restricted sense, as it is obvious there is a certain stage of maturity, previous to which it must be injurious to reap corn.

Corn is said to be green cut, when the straw is full of sap, of a greenish hue, except the part immediately below the ear, which is commonly yellow; the grain soft, but not milky; and the whole plant is perfectly pliant. However, corn ought sometimes to be reaped before the straw immediately below the ear becomes yellow; because in cold and cloudy weather, the circulation of the juices is often stopped, even when the straw appears green; and the proper stage at which corn ought to be reaped, now and then depends upon different circumstances, such as situation, state of the weather, time of the year, &c., a knowledge which can only be acquired in the school of practice.

All practical farmers agree that our common culmiferous crops die downwards; indeed, a careful examination of the plants, during the latter stages of maturation, will convince any rational individual of this truth. The ear, which is the extreme part of the plant, first assumes the hue that indicates decay; then, that part of the stalk immediately below the ear; and the change gradually proceeds downwards. The curvature of the ear, or inclination downwards, which the plant invariably assumes when it has reached maturity, is alone decisive that the plant dies downwards; because, if the under part of the stalk ripened first, it would first become weak, and consequently unable to support the heavy unripened ear. The wisdom of Nature is beautifully displayed in the dying of the plant, and curvature of the ear. By the plant dying downwards, the lower extremities retain sufficient strength to support the curved ear until the grains drop out and replenish the earth. Were the under part of the stalk first to die, the ear would fall prostrate and prematurely to the ground, and the grains would perish in the chaff. It therefore appears, that the grains of culmiferous crops have reached maturity before the curvature of the ear takes place; and all that is obtained by waiting until the appearance of this symptom, is the ripening of the straw.

Since corn dies downwards, it is clear that, as soon as the circulation of juices ceases in that part of the stalk immediately below the ear, the grains cannot derive any benefit from the rest of the plant, far less from the earth; consequently, to delay reaping corn when it has arrived at this state, is certainly losing time, and unnecessarily exposing it to the vicissitudes of the weather, without obtaining any advantage whatever. Nay, corn may even, with propriety, be reaped four or five days before reaching this state, because, during the time in question, the juices are scarce, and their circulation languid. Besides, when corn is reaped stored with juices, the process of maturation goes on for some time after; a fact which may be supported by many illustrations. The flower of red clover, after it is cut down, long remains fresh when kept in the shade, and during moist weather seems even to flourish. Every species of fruit ripens, as well as matures its seeds, after being plucked before it has reached maturity; and corn is not an exception. Experience has fully convinced me, that the process of maturation goes on after corn is cut down in a green state, and that the color of the grains is never injured thereby, though sometimes, from being bound together, and excluded from light and air when in a green state. Practical farmers, who are gifted with observation, must frequently have witnessed a whole district apparently unfit for the sickle, become, in the course of four or five days, perfectly dead ripe through the agency of good weather. Surely such corn might have been reaped with safety at the commencement of so rapid a change.

All who have reaped corn when it was completely ripened, and those who have superintended the reaping of it, must be well aware that many of the best grains drop out in handling the corn during the cutting process, as well as in the after operations, which is entirely owing to the openness of the chaff; that it is difficult, if not impossible, to prevent many stalks and ears from falling to the ground and being lost, which is owing to the stiff sapless state of the straw; and the finer the quality of the grain, the greater the loss from these two circumstances. Indeed, after an early harvest, such as that of 1821 or 1822, the loss became manifest from the grains vegetating upon the ground. The grains of completely ripened wheat and potato-oats are extremely apt to drop out; and the ears and stalks of ripe barley are most liable to be lost in cutting; and probably the late varieties of oats suffer least from being allowed to stand until perfectly ripe. But corn of every description suffers a diminution of produce from the effects of over-ripeness.

When corn is reaped before it arrives at maturity, the swollen state of the grains, and the closeness of the chaff, prevents any loss during the reaping process, as well as in the after operations; while the pliant state of the straw enables almost every stalk to be collected by careful reapers.

Though, if corn is allowed to be completely ripe before it is reaped, there are few inferior grains; yet a loss is generally sustained by good ones dropping out; and if corn is reaped before it has attained full maturity, there is no loss of good grains, but a considerable increase in the number of inferior ones; so it would appear that there is not much difference, in point of good grain produce, between ripe and green reaping; but that there is a quantity of inferior grain in favor of green reaping; and should a gale of wind intervene between the time of green and ripe reaping, the advantage, in point of produce, would be greatly in favor of early reaping.

I believe Mr. Coke was the first individual who maintained, that to reap wheat before it reaches maturity, actually improves the quality of grain and the reason assigned by him for doing so is, that as soon as wheat arrives at a certain stage of ripeness, part of the nutritious qualities goes from the kernel to the formation of bran. So, according to Mr. Coke, completely ripened wheat has more bran and less flour, than that which has been cut in a green state. This theory is certainly ingenious; but my want of experience as a manufacturer of flour and bread, prevents me from giving a decided opinion upon the subject. Were I, however, to judge from the impression which the external appearance of the grains convey, I would say, after having carefully examined the produce of a variety of experiments, that the difference of quality between wheat that has been completely ripened, and that which has been reaped twelve or fourteen days before that stage, is from one to three per cent. in favour of ripe wheat; and when there is six or eight days between the time of reaping, there is no difference of quality. But instances frequently occur in which green cutting certainly improves the quality of grain, or at least prevents it from becoming worse.

When wheat is much lodged, and overgrown with grasses, or excluded from the influence of air during a continuance of damp weather, it is apt to become discolored, and even to sprout. In such cases, early cutting speedily removes the ears from their perilous situation, and exposes them to a free circulation of air, which is always attended with good effects.

It is well known, that during damp weather, matured grain sprouts even when standing erect. And from the experience of sowing, it has been ascertained, that dry matured grain sprouts sooner than that which is damp and unmatured. Then early cutting has a powerful tendency to prevent sprouting; and it is possible to cut down wheat, and, with the aid of a favorable day, to secure it in a stack before it has arrived at a state liable to sprout.

Green reaping certainly improves the nutritive qualities of straw; and by enabling farmers to extend the time usually devoted to reaping, it would, if the practice was pretty generally adopted, enable them to do with fewer reapers, which would consequently lessen the harvest expenses.

From the foregoing observations it would appear, that by reaping corn eight or ten days previous to its becoming perfectly ripe, the quality of the grain is not injured—the quantity of grain is increased—the grain in some degree secured from the effects of wind and rain—the straw improved in quality—and the expense of harvesting lessened.

If the sun, wind and rain, were under human control, and all the ears of corn could be plucked from the straw and gathered together by the hand alone, then I would be in favor of allowing every species of corn to reach full maturity before reaping it. But when the variable and uncertain state of British weather, as well as the enumerated advantages attending green reaping, are taken into consideration, I do not hesitate to recommend the practice of green reaping to the serious attention of all practical agriculturists.

C. C.

3d June, 1834.

From the Quarterly Journal of Agriculture.

THE CULTURE OF RHUBARB.

By J. Towers.

My notice of this exquisite vegetable shall be comprised in a few lines; but these, I trust, will avail to extend its culture more and more; for any thing more productive, salubrious, profitable, and expressly suitable to the purposes of the cottager, can scarcely be found in the entire list of vegetable productions. A few years only have elapsed since the rhubartic hybrid, *green* rhubarb, was cultivated for tarts, and held in very slight estimation; but since the introduction of the larger (giant) varieties, the demand has increased with surprising rapidity. Of the two sorts which I earnestly recommend, one is called, if I mistake not, *Radford's Scarlet Goliah;* and the other is a small *red* variety, which is crimson throughout when boiled or baked. These will supply the table from April to August, and suffice for every purpose.

Culture.—Let the ground be prepared precisely as for asparagus beds. Select clean offsets, with two or three bold eyes: the first week in March is a very suitable season. The eyes or buds of the Goliah will be of a deep, rich red, hence its name: the leaves, however, and stalks are green, though of different hues, and the latter are spotted and streaked with red. In the smaller *pink* variety the red tint prevails throughout.

The plants of the great Goliah should be set firmly in the soil, five feet apart, or five feet one way and four feet another; the smaller kind may be set three feet asunder, plant from plant, giving a free watering to each to settle the soil among the roots; Dry weather, an open condition of the ground, and a temperate, unfrosty state of the air, should be preferred. When the growth becomes established, the ground must be kept free from weeds; and if dry weather supervene, water ought to be freely given around the roots, two or three times, with intervals of four or five days.

Not a leaf or stalk ought to be touched during the first year; and in autumn, when the leaves are all decayed, they should be laid in little trenches formed along the centre of the spaces between the rows, sprinkled with a handful or two of salt, and covered with the earth that had been digged out. Thus the plant will itself furnish a portion of the manure that will annually be required. As winter approaches, a coating of well decomposed stable manure or leaves, or a mixture of both, two or three inches deep, should be laid round each plant, to the extent of two feet; and in the open weather of February, the whole bed must be forked over.

As a proof of the excessive productiveness of the *Scarlet Goliah,* I need only mention, that, in the second week of March, 1831, twelve plants were set in ground prepared for asparagus. In June, the leaves met, and the whole plot was covered. In 1832, the plants yielded profusely, many leaves measured above a yard and a half over the surface, the footstalks being an inch and a half broad, and from two to three feet long. The outside leaves were, as required for use, stripped off by an oblique pull, not cut; the family was amply supplied till July and August, and yet the plants increased; the neighbours also were furnished with *leaves* throughout the summer, and with *offset plants* in the succeeding spring. During the two past seasons the root stocks increased to such a size, that, when it became needful to remove some, it required a barrow to contain the weighty mass that was raised, after great labor, from the soil. If any one try the experiment in favorable soil, and with any thing like judicious management, he will scarcely fail to discover that the growth and production of the plant will exceed every demand that can be justly made upon it.

From the Quarterly Journal of Agriculture.

CULTURE OF ARTICHOKES.

By J. Towers.

Artichoke (Cynara Scolymus) Syngenesia Polygamia Æqualis (Cl. xix. ord. 1.,) *Linnæi;* tribe Carduaceæ; among the *Compositæ* or the compound flowers of the natural "*Jussieuan*" system, is, as the tribal name implies, nearly related to the thistles; the observant natural physiologist must be aware of this from the imbricated order of flowering, and the dense close head which contains the bluish flowers, and the seeds surmounted by a feathery down *(pappus.)* In England, the full heads only are eaten boiled; these heads consist of a fleshy receptacle, on which the flowers and their bristly appendages are based; and of an alternating series of scaly bracteas or floral leaves *(involucrum,)* that are furnished with a pulpy substance at and above their point of union with the base.

Culture.—All that has been previously said as to the preparation of the ground for the asparagus, will apply to this valuable autumnal vegetable: it delights in a rich and light soil; therefore a sandy turf will supply the appropriate medium of growth. *It is propagated by suckers* or offsets taken from old plants, and planted in March and April, either in a bed of three rows, four or five feet asunder, the plants three feet from one another, or in single rows between other vegetables. The soil ought to be previously digged and laid even; and the line, being strained very tight, each sucker should be planted by the dibble or garden trowel, and fixed securely in the soil. Nothing tends so effectually to promote the growth of any sucker or offset as to place its base, and the lower parts or joints of its stem, firmly in recently moved ground. The vital principle thereby becomes stimulated, and, to speak chemically, is acted upon by the electro-gaseous products of the soil at the moment of their developement. Water, if the weather and soil be dry at the time of planting, ought to be then freely given around the plants, and, subsequently, more than once, in order to fix them in the soil, and prevent stagnation of the vital fluids.

The subsequent culture consists in keeping the ground clean and moderately open; and, at the approuch of frosty weather, to draw earth about the stems, as in landing up celery, but not bringing it to so acute a ridge at the top. Artichokes may be abundantly produced in the autumn of the first year; some plants will not, however, be prolific. The fruit ought always to be gathered, and the stems cut close off prior to the winter earthing up. In the second season the plants will become abundantly more prolific, and great care should be taken to preserve them from extreme frost by straw, haulm, or evergreen boughs, laid upon the ridges of soil so as to form a sort of roof over the herbage; but these coverings should be removed in rainy weather. The heads may be preserved throughout the winter and early spring months, by inserting the lower ends of the stems in sand, under shelter of an out-house, or cool dry cellar.

The artichoke plant produces abundance of suckers, which ought to be detached in March—not in the torpid season, and of the best of these, fresh plantations may be formed. We suggest, on the ground of the doctrine of *radical excretion,* that, if the plants stand in single rows widely apart, between which a rank of potatoes, beans, or peas, be grown—the new suckers be planted on the site of such crops, in order to reap the benefit to be derived from the matters ejected into the soil by their excretory organs, and by the actual deposition of detached vegetable fibres.

Thus artichokes and annual crops may be made every two or three seasons, to alternate or "rotate" with each other.

From the Quarterly Journal of Agriculture.

THE CULTURE OF SEA-KALE.

By J. Towers.

Sea-Kale (*Crambe maritima*) is found on our sea-coast; it belongs to that natural order which includes all the cruciform flowers (*Cruciferæ*:) the stamens are six in number, two of which are shorter than the others; hence the plant is classed in *Tetradynamia*, and is found in its first order, *Siliculosa;* the seed vessel or "pouch" is round, smooth, and about the size of a black currant. The root of the native plant—according to Sir J. E. Smith—is large and fleshy, much divided at the crown. *Herb* very glaucous (*sea-green*,) smooth, rather succulent. *Stems* several, from one to two feet high, branched, spreading, leafy. *Leaves* stalked, spreading, or deflexed, large, undulated, and toothed, of a leathery ("*coriaceous*) texture; the lowermost somewhat lyrate; the rest roundish acute." *Flowers* in dense terminal clusters, milk-white, yellowish in the centre, *fragrant*. This description accords sufficiently with the appearance of the cultivated plant; and in fact, it is known that the inhabitants of the countries where it grows wild on the shores, have always been in the habit of observing the first progress of the young shoots as they emerge from the sand, and of cutting them under the surface. In this state they are merely a species of green kale; but by culture, the shoots become a most delicate vegetable, which, while it precedes asparagus, combines much of its peculiar flavor with that of the best borecole, or *chou de Milan*. *Sea-kale* was introduced to the gardens about seventy years ago; it is now found in all the best establishments; and its culture, though peculiar, is as easy as the plant is prolific. It can be raised from seeds, and be brought to the table early in the second year. By transplanting, and division of the shoots and roots, it may be propagated abnndantly, and at any season of the year, and is so hardy as to withstand any common degree of frost. The *soil*, as indicated by its native situation and habits, should be light and sandy, with a slight addition of mild lime, muriate of soda, and wood ashes. The beds ought to be prepared as for asparagus; and of a light sandy turf, with a natural manuring of sea-weed alone—or artificially, with one-fourth of a compost consisting of perfectly reduced fern, or leaf-mould, nine parts—wood-ashes, one part—and about half a pound of common salt to every barrow-load of the compost. This last chemical compound contains a large proportion of the components of sea-water, and the wood ashes yield carbonate of lime in its most effective state, also some carbonate of potassa, and fine silex. Three barrows of light sandy turf, and one barrow of the above compost, give proportions which promise to yield a medium of growth of the most permanent and effective character. In it sea-kale and asparagus might be grown for forcing, either side by side, or in separate plots: the treatment of the one would be applicable to the other, and therefore one description will suit both. I only observe, that, if neither turf nor sea-weed can be obtained, good kale can be produced in any light garden soil, trenched in the manner before described for asparagus beds, and manured copiously with wood (not coal) ashes, and the prescribed quantity of common salt. All the difference in the two beds is this, that for *sea-kale*, or forced asparagus, the plot of ground should be large enough to permit the plants to stand in *single rows* three or four feet apart. The rows may be of any required length according to the quantity likely to be consumed. Supposing that six or eight rows, each twelve feet long, be required, then the ground is either to be trenched twenty inches deep at the least, or digged out and replaced with the enriched turf; and the work ought to be completed before March, so as to become settled by the middle or latter end of that month. Between every row there should two stakes be set up at each end, two feet asunder; these will mark the *beds* and the *spaces* between them; thus there may be eight beds and nine spaces or divisions. At the time of *sowing* the beds—(I greatly prefer seed to plants)—leave a space on the outside of two of the outermost stakes, and strain a garden line exactly along the middle of the bed immediately within, and next to it; and beginning at one end of the line—but a foot within it—make a small ring or circle with the finger, an inch deep, and three inches wide; or what is better, force a circular piece of iron or wood into the ground to the required depth, and drop three seeds in the ring so formed, equidistant, and at right angles with one another. Form and sow the rings about fifteen inches asunder—centre from centre, the whole length of the line; then cover the seeds to the surface depth with sand, and pat it to a level with the flat of a spade; one row or *bed* will thus be sown. Leave the adjoining *space* of two feet vacant; and proceed to the bed or division next beyond it: sow that, and proceed in the same alternate order till the plot be completed; when a space exterior of the last sown division must be left, and it will then be found that whatever be the number of divisions sown, that of the unsown *spaces* will exceed it by one. The plan thus laid down is grounded upon the practice of the celebrated Bath cultivators; and nothing can exceed it for the facility it affords to good tillage, and orderly, convenient forcing. It must be apparent to every one versed in horticulture, that *asparagus* can thus be sown or planted, and be cultivated—*for forcing*—with every advantage afforded to sea-kale, as will be further shown in the detail.

If the seed be good, the season propitious, warm, and moist, germination will rapidly advance, and when the plants appear, they may be secured from vermin by sprinkling around and within them a good covering of wood-ashes (three parts,) blended with soot and powdered lime, of each one part. If weeds arise and threaten to surmount the plants, they must be kept under by surface-hoeing to the depth of an inch, with the "Dutch," or thrust-hoe. Perhaps three plants will rise from each ring, and these, indeed *all* that grow, must remain till they begin to interfere with each other; then, one only, the strongest, must be left, and the others drawn, or raised up; so that a complete row of single plants, from 1 foot to 15 inches apart, finally remain. The young supernumeraries may be set out in rows, to grow for succession, or be thrown away if no more stock be required. The plants in the rows will grow luxuriantly, and become very large, so much so as, in all probability, to come in contact, forming one connected line of sea-green foliage. All the culture during the summer and autumn, will consist in keeping the *beds* clear from weeds, and in digging alternate *spaces* two or three times, to the depth of 9 inches, so as to pulverize and render the soil as fine as possible. At the two last operations (say in July and October,) it would be as well to incorporate with the soil a two-inch layer of decayed leaves, mixed with one-fourth part of pure wood-ashes.

The reader will be very careful to avoid sea-coal, or even pit-coal ashes. It formerly was the custom to cover sea-kale with conical hills of those ashes during winter, and one out of three or four plants perished, the damage being ascribed to mice, or moles. I never have lost a plant since I left off that acrimonious chemical compound, styled ashes, nor could I, by any means keep my bed entire, while I employed it. Its destructive influence has at length been admitted, and sea-kale now enjoys a regular growth, and repays its cultivator. No *forcing* ought to be attempted during the first winter; but it would not be amiss, after clearing off all the old leaves, to strain a line along the edges of the beds, and cutting the earth by it three inches deep, to mould up the *two-feet beds* with the earth taken to that depth from the intermediate spaces. A tall marking stick should, however, be placed near the centres of the plants. After the "earthing up," a blanching-pot, wooden box, or old bee-hive, is to be set over every plant. A straw-hive is indeed an excellent material. It is sufficiently strong, warm, and impervious to light, even when used alone, without leaves, for blanching. A small, or even a very tolerable gathering of fine white kale will be the result of this treatment, earlier or later, according to the season and climate; and, in cutting it, the knife should be passed below the surface of the stratum of soil that was added, so as to bring up each full-sized shoot in a compact state, and not in detached leaves. The smaller sprouts ought not to be cut; and, when all the large ones have been taken, the superposed soil should be drawn back into the *spaces*, and the whole plot reduced to an even surface-level. This work will, it is presumed, be performed about mid-April, and then a knife, or very sharp-edged spade, should be passed through the shoots, so as to cut off every one that rises above the original level of the bed. This cutting will induce the plants to send forth a number of fresh shoots, and prevent, in a degree, the protrusion of flower stems. The routine culture of the second season will comprise *weeding* with a flat hoe, *digging* and *enriching* of the *spaces*, as before directed, and the immediate *excision* of every flower-stem that may be sent up.

Forcing.—(These directions will apply equally to asparagus in single rows, by the second method.) After the leaves of the sea-kale, and stems of asparagus have become inactive, remove the former, and cut off the latter. Mark each sea-kale plant with a tall stick, dig and mould up the beds with fine earth from the spaces, as in the previous season; but now, and in each succeeding year, dig out, and remove to a spot at hand (as convenience may point out,) the earth of each space, on the sides of those rows which are to be excited, so as to leave trenches one foot deep. The plots ought to be so contrived as to furnish three distinct forcings, the *first* to commence late in November, to be cut at the close of the year; the *second* about the first week in January; and the *third* early in February. A *fourth* reserve ought to come in at the natural season, *blanched*, but not *forced*, in April. The trenches are to be filled to the level of the tops of the line of pots or covers with tree-leaves, blended, if possible, with one-third part of fresh stable manure. When this level is attained, the pots, and spaces between them, must be covered to the depth of two feet with the same materials; but for asparagus, *which can have no pots*, leaves alone are recommended to the depth of 18 inches. If shallow boxes or troughs, formed of three strips of boards fastened together, and five or six inches deep, could be inverted over the whole line of asparagus, the mixture of dung and leaves might be safely employed.

The bed of fermenting material, in either case, ought to form a compact mass of equal depth; and this it would be advisable to cover with straw, hurdles, or thatch, to keep out excessive rains, and to retain the developed heat. Trial-sticks should be thrust deeply into the masses; and if these, on being withdrawn, feel gently warm, the work of forcing will proceed regularly; and kale and grass will be procured in succession from Christmas to the end of March; to be succeeded by the crops from the unexcited bed. After forcing, and clearing off the leaves, &c. the trenches are always to be filled up, and the surface-level restored. The slight difference to be observed in treating these two delicious vegetables, will soon be sufficiently obvious to every cultivator of discernment, and need not be alluded to at this time.

From the Farmer's Magazine.

SIR JOHN SINCLAIR'S CODE OF AGRICULTURE.

A new edition, being the third, of this work, has just appeared, which, at such a time as this, when agriculturists of all descriptions are so much depressed, is a proof of the high estimation in which it is held by the public. The present edition will be found still more valuable than either of the former. It is improved, both by what has been withdrawn, which indeed is not much, and by what has been added; while the whole work has been carefully revised and corrected, both in its doctrines and its reasonings. Sir John, we perceive, is now almost, if not altogether, an entire convert to the sentiments of Mr. Coke and some others, in regard to the drilling of corn of all kinds, and, with a few exceptions, upon all soils. On this point, perhaps, his opinions may not be assented to by many intelligent farmers in Scotland, who, though they would not object to the general principle, still do not think, that, in our climate, and especially upon strong clays, drilling can be adopted so advantageously as upon the light soils, and with the earlier seasons of Norfolk; or that it can ever be generally substituted for broad-casting in this part of the island. It is certainly true, however, on the other hand, that it might be carried much farther than it has ever been with us, with a fair prospect of ample remuneration for the additional expense required, particularly on lands much infested with annual weeds, and on such as are to be sown with grass seeds. As the subject has been much discussed of late, and is in itself of no small importance, we shall give the worthy Baronet's sentiments on it, as they appear in this edition of his work; and we can assure our readers that he has taken great pains to procure the best information.[*]

DRILLING CORN [OR WHEAT, &c.;] WITH OBSERVATIONS ON THE ROW CULTURE, FOR CROPS OF GRAIN.

The question, whether it is most expedient or profitable to raise culmiferous crops according to the broadcast or drilled system, has agitated the agricultural world for a number of years; and as it is a point respecting which there still exists a great diversity of opinion, it may be proper here to detail the arguments on both sides, that the reader may be enabled to form a decided opinion, which ought generally to be preferred; and in what particular cases either the row, or the broadcast system of culture, ought to be adopted.

The arguments against drilling are, 1. That it is not likely to be profitable on a small scale, on account of the expense of the machinery for the different operations of sowing, hoeing, &c.; 2. That these operations must often occasion delays incompatible with the hurry of an extensive autumnal or spring sowing—at least in wet seasons and on wet soils, however little it may be felt in dry seasons and on dry soils; 3. That the drill machine does not answer where the soil is too full of small stones to allow the coulters to sink to a proper depth, and, of course, that the seed is not sufficiently covered to produce an abundant crop;[§] 4. That it is not so well calculated for steep lands;[†] and, 5. That the grain is more liable to be shaken by winds, and the harvest to be later on drilled fields, than on those which are sown broadcast; and consequently, that is not so well calculated for a windy and a northern climate.

Some other objections were formerly urged against drilling, which the recent improvements in the system have effectually removed. For instance, it was anciently the practice *to earth up the plants;* the consequence of which was, that, in rich soils, the vigor of the soil was exhausted on the stems or foliage, instead of the fruit; and though the straw was strong and abundant, the grain was often defective in quality, or greatly diminished in quantity; whereas, now, it is a maxim in the school of Holkham, '*That white straw crops will 'be injured, if earthed up upon any soil.*'[‡]

It is likewise urged, that it might not be practicable, in many districts, to find a sufficient number of laborers to hoe the drills, were all the crops on a farm to be subjected to that process. But, in the present state of the country, with an overflowing and unemployed population, a new source of occupation to the peasantry would be most desirable, provided their employers were remunerated for the expenses they incurred;[*] and, where there is a scarcity of male laborers, women and boys have, in many of the agricultural districts, as in Gloucestershire, been taught the art, and have been found most expert at hoeing.

It has further been urged against the use of the drill machine, that where seed has been steeped, and encrusted with lime, as a preventive of the smut, the lime destroys the brushes, and impedes the regular delivery of the seed. But this objection is easily removed, by using *cups* instead of brushes, or by steeping the seed in a solution of the sulphate of copper, in a manner to be afterwards described.[**] The seed, in that case, might be sown in a few hours after the solution has been applied, *without lime,* and with a certainty of preventing smut.

The introduction of the drill system is, by numbers of the most distinguished agriculturists, considered to be the most important of all modern improvements, and to be well entitled to universal adoption. It is principally recommended on the following grounds. 1. That the broadcast system is a less perfect, and a less economical mode of cultivation than that of drilling; for the seed can neither be deposited in the soil with the same exactness, in regard to depth, regularity, or proportion,[†] nor be so placed that the crop can afterwards be improved in its progress to maturity.[††] 2. That in light soils, drilling has the important advantage of giving the grain *a good hold* of the ground, and of giving all the seed the same depth of soil,[‡] by which the frost is prevented from throwing out the plants in spring, or the wind from loosening the roots, after the stem gets high, or when the ear is filling. 3. That by the improved practices in drilling, the use of manures is both encouraged and economized, so as to diminish the quantity necessary, and to increase its powers, by bringing it into immediate contact with the plant;[§] and that a heavy crop of drilled corn, where the weeds are thoroughly destroyed, will be found much less injurious to the fertility of the soil, though raised with less manure, than the same crop grown broadcast, with a greater quantity of manure, but incumbered with weeds. 4. That it gives an opportunity for cleansing the ground, even when the crop is growing—of completely extirpating annual weeds—of checking the growth of root-weeds—and of preventing weeds in general from being injurious to the crop. 5. That if the land is not hoed, but hand-weeded, less damage will be done to the crop, by the weeder's feet passing *between* the rows of plants, than by *treading upon them*, as must inevitably be the case when working promiscuously over the ground. 6. That the progress of the grain, after the scarifier has worked upon the soil, is attended with the most beneficial effects.* 7. That drilling is peculiarly calculated *for inferior soils*, and brings their produce more nearly on a footing with that of fertile land, than could otherwise be obtained.† 8. That the pulverization of the soil between the rows of autumn or winter sown wheat, is of the greatest benefit to the clover seeds sown in spring; and that the admission of air between the rows is of use to the corn crop,‡ as well as to the grass seeds sown with it. 9. That drilled crops of white corn, from the greater strength of their straw, are less apt to lodge, or to be beaten down in wet seasons;§ and are much less subject to other casualties, in particular to the diseases to which wheat is unfortunately liable. 10. That the expense of cutting down a drilled crop in harvest, is uniformly less than that of one which is sown broadcast, since three reapers will do as much work in the former case, as four in the latter. 11. That drilled crops are more equal in growth, and, in general, better in quality than the broadcast. And, 12. That drilling may be of use in regard to the grub and other vermin. The hoeing in spring may assist in destroying them; or, at least, by the treading of the hoers, and the stirring of the soil by the hoes, a check may be given to their depredations.

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[*] Having the 5th edition of the Code of Agriculture before us, it has been used in part, as more full than the 3d edition, to copy the following article.—Ed. Far. Reg.

[§] The use of '*The Lever Drill*' removes this objection.

[†] This objection is obviated by an addition to the machinery. The seed-box is fastened on a pivot, or by a screw; and the position of the box is adjusted to the ascent or descent, without any difficulty.

[‡] Communication from Mr. Blaikie at Holkham. Yet, *in very poor soils*, it may be expedient to try the effect of earthing up, with wider intervals, so that the hoeing will not injure the surface roots. In rich soils, it would be decidedly injurious. It was only on that point that the author entertained any doubt as to the utility of drilling, which the new practice, of avoiding earthing up, has removed.

[*] Remark by Edward Burroughs, Esq.

[*] Inserted in Farmers' Register at p. 337 vol. III.—Ed.

[†] It is a great advantage to place the seed at a proper depth, so as to secure a sufficient degree of moisture to promote germination, and to make this deposition uniform, that the grain may spring and ripen more equally.

[††] Dickson's Husbandry, vol. i. p. 466.

[‡] This is an advantage peculiar to drilling; for, when crops are *ploughed in*, some of the seed will go to the bottom of the furrow, some will be left half way, and some will even be left at the top. In fact, the depth of seed, when ploughed in, unless well executed, is often more irregular than when harrowed in.

[§] On a field sown in drills 12 inches apart, which received one hoeing in spring, a more productive crop, and by far more valuable grain was raised, than on a broadcast crop, which had received three times the quantity of dung. The manure for the drilled crop of wheat, was applied in drills made by the plough, the seed sown, and then harrowed down.

In regard to any saving of seed, which by some is considered an advantage, Mr. Coke of Holkham is decidedly of opinion, that such an idea is founded on erroneous principles, and that any economy of that sort ought not to be attempted. It is indeed of use to have the roots matted together, if there is substance enough in the soil to nourish the plants; and it is found, that wheat thrives best on a firm and compact bottom, which prevents the roots from being long and straggling.

Innumerable instances might be brought forward, of heavy crops having been produced under the drill system, by those who have bestowed much care in trying the experiment; and it has often answered, even on a great scale, when properly executed. But its success must depend upon the intelligence attention, perseverance and capital of the farmer.

As it has been carried to the highest perfection, and cultivated to the greater extent, on the farm and on the estates of that distinguished agriculturist, Mr. Coke of Holkham, it may be proper to give a short account of his practice. He uses the Rev. Mr. Cooke's drill which is drawn by a single horse, and sows six rows at a time, and an acre in an hour. His wheat he sows at nine inches asunder, his barley at six inches three quarters. The quantity of seed which he sows per acre, is three bushels of barley, and six of oats. In regard to wheat, the average quantity which he prefers, is four bushels per acre. By depositing such a quantity of seed, there is no occasion to earth up the plants, for the sake of promoting tillering. On rich soils, it is the practice, to draw the drills from north to south, because the rays of the sun, when in his greatest altitude, striking directly between the rows of corn, have a powerful effect in strengthening the straw, and by absorbing the damp from the earth, become a powerful auxiliary in preventing mildew. On poor soils, on the other hand, the lines should be drawn from east to west, if the nature of the ground will admit of that plan being followed. Cooke's fixed drill-harrow, is used once in spring, the hand-hoe is used twice, the land is cleared of weeds, but the soil is not earthed up, nor accumulated against the corn. The hoeings cost about twenty pence each, per acre. The largenes of the crops, particularly of barley, and oats, raised even on poor land, under this system, is hardly to be credited, and they are sometimes also of a superior quality.

A great improvement has recently been made in drilling, by the introduction of "The Inverted Hoes," invented by Mr. Blaikie. They consist of a pair of blades, for each interval, going one before the other, and each having *the heel* turned to the row. This disposition of the blades prevents, 1. *Cutting the plants, or their roots;*—2. *Moulding up;*—and 3. *Clogging.* They may be used, though the rows of corn are only nine inches distant from each other; and it is found, that the occasional trampling of the horse on the young plants, is not attended with injurious consequences.

It was formerly believed, that drilling was only applicable to light soils; but in Suffolk, strong or heavy land is now cultivated for spring crops, in drills, in a most perfect manner. The ridges are, all carefully ploughed in autumn, or early in winter, to *the exact breadth*, which suits either one movement of the drill machine, or two. In the spring, the land is only scarified or harrowed, as it has been rendered thoroughly friable by the winter's frost, and the corn is drilled, without a horse's foot treading any where, except in the furrows between the ridges. Unless this practice is adopted, it would be difficult, in very wet seasons, to carry on the operations of the drill system, on heavy soils, with the regularity and exactness that are necessary.

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*Communications from J. C. Curwen, Esq. M. P.

†Mr. Blaikie at Holkham states, that it is no uncommon circumstance to have from inferior land in Norfolk, rented only at from 15 to 30s. per acre, as much produce as from land that, in other districts, pays from £5 to £6 per acre. From land of an inferior quality, paying only 20s. for rent, and 5s. for tithe, 41 bushels of wheat per acre have been obtained, under the drill system.

‡It is absurd to suppose that the access of *air*, so essential to the growth and health of plants, should not be of service to the roots of plants, if means could be contrived (as is the case under the drill system) by which its access can be obtained.

Where soils are *very poor*, the plan adopted in the cultivation of turnips ought to be extended to grain, that of placing the manure in the centre of a drill, and sowing the grain above it.

§This has been doubted; but the drillists are, in this point, supported by respectable authority. The Rev. Adam Dickson, in his Treatise on Agriculture, vol. ii. p. 61 and 62, remarks, 'That weeds, keep the air from 'the roots of corn, and thereby expose it to be lodged.' He observes, in another place, 'That when corn is sown 'in rows, with intervals, the admission of air strength-'ens the stalks, which prevents the corn from lodging.' vol. i. p. 526. Besides, it is well known that, when corn is lodged, it suffers less, if it has been drilled, than the broadcast, there being, between the rows, an admission of air which tends to dry the stems, and to render it sooner fit for being harvested.

In other parts of England, as in Kent and Hertfordshire, the drilling of strong lands is practised, for winter as well as spring crops; and Mr. Childe, in Shropshire, drills all his crops, on the most adhesive clay, and in a hilly country, with the greatest success.

The propriety of drilling in Scotland, shall be discussed in the Appendix, as, owing to the peculiarities of the soils and climate of that country, it is necessary to enter more into detail, than with reference to England.

Besides drilling, &c. as above described, there are other modes by which grain can be cultivated *in rows*. Sometimes, by means of a drill-roller, a number of ruts are made at the distance of from eight to ten inches apart, over the whole of which, the seed is sown broad-cast, and swept into the hollows by a brush-harrow. In this way wheat has been raised on light lands, where otherwise it would have been impracticable.

There is another mode of cultivating wheat in rows, called "*ribbing*," which is much practiced in Northumberland. As soon as the ground is properly prepared, it is made up into small ribs, by a single-horse plough. The seed is then sown broad-cast among the ribs, or a person with a barrow-drill, goes along every rib, and drops the seed along the bottom, which is covered by a light harrow, drawn straight up and down the ridge. In either case, the plant makes its appearance nearly at the same time above ground; nor is there any difference, in this respect, between the two systems. The mode of ribbing is a simpler process than that of drilling; it may be executed in worse weather; the expense of a drilling machine is saved; and the crop may have all the advantages of hoeing, as if it had been drilled. But it does not suit all soils and rotations, or previous crops; for instance, strong clayey soils cannot be sufficiently pulverized for that purpose, nor can ribbing be successfully adopted with clover ley, unless it be twice ploughed, and thoroughly harrowed.

To these however, who are accustomed to *plough in* their seed, the drill barrow, either attached to the plough, or following it in the furrow, pushed on by a boy, would at once establish the row-culture, without difficulty, and with little expense, over an extensive tract of cultivated land in England. The advantage of this simple improvement, can hardly be sufficiently appreciated. *Annual* weeds would be extirpated, and root weeds checked: and without dwelling on the immediate advantages of the system, the observation is perfectly well founded "were it even admitted, that drilled crops are not at first superior to the broad-cast, (the contrary of which has been found in numerous instances,) yet in a succession of years, the progressive effects of constant hoeing, will render the drilled ones greatly superior."

The cultivation of culmiferous crops *in rows*, may therefore be justly accounted, the best method hitherto known, of raising crops of corn; and by promoting at the same time, the destruction of weeds, of preserving the fertility of the soil.

It is an additional reason for recommending drilling, that it would lead to habits of accuracy and neatness in all the other branches of arable culture; whereas broad-cast sowing, encourages those slovenly practices, which still prevail but too generally in farming concerns. There is every reason indeed to believe, that the system would become general, where it once admitted to be *an established maxim*, (which the information above detailed sufficiently justifies,) that drilling corn, like drilling turnips, is superior to broadcast. Farmers would then prepare for it, by furnishing themselves with the necessary implements, and by dressing and cleansing the soil, with peculiar and minute attention. There might still be some exceptions, as on very strong clays, or in very unfavorable seasons; but these exceptions, as in the case of drilling turnips, would become every day less numerous. Our fields would then be cultivated with the same regularity and neatness as our gardens, and would become equally produative.

On the whole, such is the importance of the drill system, that its general adoption ought to be promoted as far as is practicable. Models or engravings of the simplest, and best machines, and directions for their use, ought every where to be circulated, and liberal encouragement given to those, who will prove, by accurate experiments, in districts where it is at present either entirely unknown, or but little practised, the utility of the system, and the profit to be derived from it. By the extension of drilling, inferior soils might soon be rendered nearly as productive as those naturally more fertile. In many cases also, by the introduction of this system, naked fallows might be abolished, where at present they are unnecessarily practised; and by these means, a treasure of solid and permanent wealth, in useful and valuable produce, might be rapidly spread, over the whole surface of the country.

From the [Edinburgh] Farmer's Magazine.

ON THE MAKING AND CURING OF BUTTER.

Extract from an Essay by William Aiton, Esq.

The directions given by your correspondent as to milk-houses, appear to me to be correct; and I humbly suggest, that the proprietors should provide their tenants in proper milk and dairy-houses. I see no reason, however, for placing such houses far from either the kitchen or the byre, or entirely separated from the other buildings; provided that the effluvia from the byre do not reach the milk-house. When at a distance from the byre, the milk may be injured by exposure to the weather, in passing from the byre to the milkhouse. The milkhouse ought to be screened as much as possible from the heat of the sun, to be roofed with *turf* and *thatch*, and by no means with slates or tiles. The rays of the sun should never be allowed to enter the milkhouse.

Your correspondent observes correctly, that the cream and milk should be passed through a sieve or search. But I would have that done when the cream was about to be churned, and the milk when ready to be coagulated for cheese. If it is strained when newly drawn from the cow, the milk is hurt by agitation, and more exposed to the air than is necessary; and every chemist, as well as every dairywoman, will attest, that the cream always rises better when the milk has been least agitated, and the froth raised in milking preserved. The froth raised on the milk by a good milker, spreads over its surface in the coolers (provided the milk has not been much agitated,) and protects the aroma and most valuable qualities of the milk from the exhaling powers of the atmosphere; in the same way that ale and porter throw up a sort of cream, to protect themselves from atmospheric influence. On that account, no skilful dairymaid will either pass the milk through a search until it has cast up the cream, nor yet use a pail in taking the milk from the byre to the coolers. The more milk is agitated, and especially when warm from the cow, the sooner will it sour, and the more rancid will the cheese and butter become. I would, therefore, have the milk emptied from the milker's cog into the coolers, and searched when about to be churned, or the curd set. One of the advantages derived from young animals being suckled, instead of being fed from a dish, is, that none of the aroma, or most volatile qualities of the milk, are lost.

Your correspondent also recommends, that the milk shall, '*when cool*, be put into sweet well-seasoned oaken cogs, keelers, or milk-pans.' But, with submission, I would recommend to place the milk in these coolers or stand-vats whenever it comes from the cow, and *before it has cooled*. If the milk remains in the milker's cogs, which are deep and narrow, till it cools, and is then turned over into the milk-pans or coolers, it will be much longer in cooling, and more agitated, than when placed in the coolers at once. And if it is put into one vessel to cool, and into another to cast up the cream, the injury will be still greater. The sooner that the milk is cooled after coming from the cow, and the less it is agitated, the better. In well-managed dairies, and when the weather is hot, a small quantity of cold spring-water is put into every one of the coolers, in order to cool the milk the sooner, and make it cast up the cream; for when milk is strong and thick, it does not cast up its cream so well as when it is thin, though the cream of thick milk is richest. To obtain the richest butter, the first drawn milk should be laid aside, and only the cream that rises first churned.

The coolers may be made of oaken wood, or earthern ware well leaded; or, what is still better, they are now made of iron, well tinned in the inside, and with a sort of paint on the outside, that prevents them from rusting. Mr. Baird, at Shotts Iron-work, has manufactured great numbers of these iron coolers, and they will soon supersede the use of those made of wood. The iron ones are only about the same price as those of wood, and they are more easily cleaned, cool the milk sooner, and will last far longer than wooden dishes. If the paint on the outside, or tin within, should fail, they can be replaced at a small expense. The milk ought to be placed about three, or not more than four inches deep in the coolers, and to stand from twenty-four to thirty-six hours, if the whole cream is wished for. In the dairy districts, the milk is now generally placed into stone cisterns, so large as to hold the whole milking; and the milk is let out by a trap-hole at the bottom, and the cream received into a separate dish. But these cisterns are not suited to small dairies.

Your correspondent also directs, that the cream should always be churned when it is '*fresh*.' To this I object for two reasons. First, it is only in very large dairies that the cream can be churned while it is fresh. The milk must stand from twenty-four to thirty-six hours in order to cast up the cream, and after that is removed from the milk, it will be difficult to keep the cream fresh twenty-four hours more; so that to churn it fresh you cannot get more than two days cream into the churn at once; and in most of the dairies I saw in Aberdeenshire, the cream of two days collection would not fill a water-stoup; and not a few of them would require a churn still smaller. This would greatly multiply the labor for no useful purpose. But, second, if churning the cream fresh were more easily accomplished than it is, it can serve no good end to practice it. Sour cream makes as good butter as that which is churned fresh. In fact it is quite impossible to make butter from cream till it is soured. You may commence the operation of churning while the cream is fresh, but it will, and must be sour before the butter is formed; and it is better to allow it to sour in the natural way, than to force on acidity by agitation in the churn. Natural souring does no injury to the butter, but improves it; while rendering the cream hastily sour, by severe agitation, softens and injures the butter by too much heat. In the improved butter and butter-milk district round Glasgow, the whole milk as it comes from the cow is churned, and the greatest pains are taken to have the whole milk and cream soured and coagulated (lappered, as they call it) some days before it is churned; and the butter in that district, and made in that way, is, *cæteris paribus*, equal to the best in Britain. No dairy farmer in that district would, on any account, admit a single pint of milk into the churn that had not been soured and coagulated for some days. Neither would they allow it to sour otherwise than in its natural course. When fresh or sweet milk is churned, an unnatural fermentation is forced upon it, and that leads to putridity much sooner than when the souring is is brought on in the natural way. I agree with the directions given in the communication referred to, that milk yielded by cows during the two first days after calving, should not be mixed with other milk, or churned. The first drawn milk after the cow has calved will, no doubt, yield three times as much butter as ordinary milk. But that milk is so much disposed to putridity, that even the butter extracted from it cannot be wholesome. And it has such a high red colour as to render other butter freckled when mixed with it.

I surveyed last summer many dairies in the counties of Dumfries and Cumberland, where vast quantities of butter of the greatest celebrity is made for the London market, and I did not find one farmer who churned his cream fresh. They all collect their cream in earthern-ware pitchers, or wooden coolers, for at least a week, and some ten days and more. Some of them stir the cream once a day or two days, with a wooden spurtle, to keep it from clotting and throwing off the serum, and others do not stir it at all. Either way may do, but I am rather partial to the plan of stirring, if the cream is not churned soon after being taken from the milk.

The directions given by your correspondent for churning, washing, and salting the butter, seem to me to be correct; only I would recommend, by all means, to mix in the salt soon after the butter is churned and well washed, and, at any rate, before it becomes quite firm. If once butter has consolidated, it is much injured by being again beaten or trodden soft, or baked into a paste; and even when that is done, the salt cannot be so easily and completely mixed with it as it would be when it has been merely cooled a little, but not become firm. If the salt is not completely and equally mixed through the whole mass, the butter becomes darker in colour where the salt rests, and whiter and rancid where it has not reached. This is termed *pyety* butter, which always sells at an inferior price.

Mixing old and new butter together, or even that of different qualities, or from many different dairies, some of it good and some of it inferior, is bad management, as that of the worst quality will contaminate the best. A little leaven will in that case leaven the whole lump.

Your correspondent wishes the salt to be kept dry till it is used, but not to be placed near the fire, lest it should become tinged with smoke; but I do not know how salt can be kept dry without artificial heat: And I must enter my protest against placing new lime under or near the butter, as he directs, or even in the same apartment with it.

I concur in opinion with your correspondent, that cream should not be scalded; but as, in making butter (as in every other chemical process) the utmost attention should be paid to temperature, I beg leave humbly to offer my opinion on the degrees of heat that I conceive to be proper for milk in all its stages, from the time it is taken from the cow till the butter is churned and salted.

While milk is in the coolers to cast up the cream, it should be kept as nearly as possible in a temperature of about 50 or 52 degrees on Fahrenheit's scale. In summer it may sometimes be difficult or even impossible to keep the milkhouse at a temperature so low; but great care should be taken, by excluding the sun and hot winds, frequently washing the floor with cold water, &c. to keep it cool. When the pavement is washed, it should be well dried with a cloth, so as the milk may not be injured by the exhalations from the wet flour. But too much heat, at this stage of the process, ought not only to be avoided, but great care should also be taken to prevent the milk from being at any time too cold. If the milk is kept too warm, it does not cast up the cream, and soon becomes putrid; and when it is kept too cool, the butter is white, and of inferior quality, with little flavor, and neither unctious nor rich. It is not enough that the temperature of cream be raised before or during the operation of churning; it ought to be kept at all times in a moderate degree of heat, and, if possible, in an equal temperature.

If the cream is in about 54 or 56 degrees of heat when put into the churn, it may be churned without any application of artificial heat, and the agitation in churning will raise it to the temperature of 70 or 74 degrees, at which butter is formed. But if the cream is colder than 54 degrees, I would advise the application of artificial heat to raise it to about 56 degrees, or more. This may be done by placing the cream over night in a warmer atmosphere, or by mixing into it a portion of hot water. But the most proper course is, to prevent the milk and cream from ever becoming too cold. If hot water is mixed into the cream to raise its temperature, it should be poured in by one person, while another is churning, so as it may not melt the cream. Hot water so applied has been objected to, because it was thought to impair the color and quality of the butter. I would not pretend to say that the water can improve the butter. On the contrary, the butter is often of too white a color where much hot water has been put into the churn. But this does not proceed so much from the water so applied, as from the milk or cream having been previously too cold. If the temperature of the cream were to be raised, by placing it near a fire or otherwise, without any admixture whatever, or by long and severe agitation in the churn, still the butter would be white, brittle, and of inferior quality. The manufacturers of butter and sour milk in the vicinity of Glasgow, instead of raising the temperature of the milk and cream (for they churn both together) by agitation, uniformly raise it from the temperature of the milk house to nearly that at which the butter is formed, by the application of hot water; and yet their butter is of the very best quality, and of good colour. When the milk or cream is too cold at the time of churning, it emits a hard rattling sound when agitated, appears of a white color, and throws up innumerable white bubbles. But as it acquires more heat, either from agitation, or from whatever cause, the sound becomes softer and more *soughing*, the milk or cream assumes a darker, yellower color; and as the butter begins to form, and to rise to the surface by churning, which brings on a fermentation of its own kind, the whole mass acquires a yellow color.

It is necessary, however, to guard against raising the temperature too high, during the operation of churning, otherwise the butter may be much injured even by agitation alone. The process of churning should be conducted slowly; and the more so, if the temperature of the milk or cream has been much above 55° when begun to be churned. In that case, and where but a small quantity is churned together, the churning should not be carried on more than three or four minutes at a time, so as to occupy nearly two hours in churning even a small quantity, and still longer where the quantity churned is large,

Whenever the butter is completely formed, it ought to be instantly turned into fresh and cold spring water; and after being slightly stirred or mixed into the water with a large wooden spoon or skimming dish, so as the whole butter may be reached by the cold water, and part of the milk may be washed out, the butter should remain in the water about ten or fifteen minutes, so as it may become somewhat firmer before the operation of washing. I say *somewhat* firmer, but not by any means to become completely cold and firm, till it has been well washed and salted. It would be wrong to beat or knead the butter too much while it was very soft; but as it can neither be properly washed, nor the salt well mixed into it, except when it is soft, there can be no propriety in making it cold and firm, by long immersion in cold water, and then to soften it for washing and salting, by tramping or baking, or otherwise. It is much better to finish these processes before the butter has been completely hardened. Three or four changes of water, with a small quantity of salt in each, are necessary to separate impurities from the butter; and the butter must be well stirred and minutely mixed with a wooden spoon into the water, to render it clean; but it should not be beaten by human hand or foot.

The butter, whenever it is duly washed, should be instantly salted, the salt well mixed equally into every part of the mass; and whenever that is done, the butter should be compactly kneaded into a cask, and covered over on the surface with a wet cloth, if the cask is not full.

As I write this from memory, and at a distance from my notes, I cannot well say what quantity of salt ought to be applied to a given weight of butter. So far as my recollection goes, half an ounce of salt, two drachms of sugar, and two drachms of nitre, to 16 ounces of butter, is the proper mode of curing. The sugar improves the taste, and the nitre the color of the butter; and both of them act with the salt in preserving the butter from becoming rancid.

If the butter is churned, washed, salted and stored in the manner I have pointed out, and brine kept in the casks, it will remain free of rancidity for nearly twelve months; whereas the Aberdeen butter generally becomes rancid by the month of January after it is made. The Irish butter is in good condition till the month of May, and well cured Scots butter still longer.

All these processes are so simple and easy that every tenant in Aberdeenshire may understand them, and by reducing them to practice, they may both make and cure their butter as well as the inhabitants of other districts; and by doing so, the article would come to market much improved, while the farmers would draw the whole profits themselves, instead of sharing them with the curers. The curing of the butter is one of the easiest operations of the dairy. If a person can wash butter, they may also salt it; and if the butter is not washed till it reaches the curers, a week or more after churning, the milk and impurities must have by that time contaminated the butter to such a degree that no after-washing can completely remove.

For the Farmers' Register.

SOME OBSERVATIONS ON HOUSEKEEPING—THE DUST REMEDY.

Wardsfork, Charlotte.

As the housekeeping department has been rather too much overlooked of late, and of course the ladies slighted, I have chosen a subject which the fair reader may find interesting and useful. Housekeeping is the twin sister of agriculture, and so much alike, that you can hardly tell one from the other. The greatest distinction between these fair goddesses, is, that the men in all civilized times have payed their homage to the one, while the women have bowed submission to the other. As housekeeping is the sphere allotted to these fair ones, and as this is the principal theatre upon which they display their excellencies and virtues, surely it should be celebrated in the annals of husbandry. Tis true that mere housekeeping does not claim such a portion of the money-making exertion; but it has no small share in the money-saving operations. The accumulation of estate may be more dependent on agriculture, but our comfort is more involved in housekeeping. The gold of mountains, the pearls of oceans, will not compensate for the loss of that domestic comfort which is the result of neatness, order, and taste, which is displayed by the wife, whose "price is far above rubies." Compared with these industrious, useful, and dignified matrons, how little are the vain and idle butterflies of fashion that are continually buzzing abroad in the summer's sun of folly, and dissipation. But to the point.

As dust is one of those anoyances, against which every neat woman has declared war, in whatsoever shape it may come, I herein offer my services to aid them in subduing so foul an invader of their peace and happiness. Many schemes have been devised, in all times and places, by the heroines contending for the palm of neatness; but the most successful has not been able to rout this vile intruder from the parlor. Hewed timbers, brick and stone walks, shoe-scrapers, mats and millstones, have all had their day, but all have proven unavailing. With great pleasure I announce to the public in general, and to the ladies in particular, that the subtle foe is at length vanquished by most simple measures; for which discovery I. expect to be much honored by the good housewives, which I think more of than the highest praise that could be bestowed on me by all the host of politicians of either party, for any political achievement. The discovery is just this: Fill the walks leading from your styles, garden, kitchen, to the dwelling house, with saw-dust of heart pine, about four inches deep. Its sponginess will keep it dry; it will readily take the mud from the shoe, and every rain will wash the deposite through the mass of saw dust to the bottom, keeping the top clean, and it will last for years. In this way you get rid of dust in the house; for observe, dust gets into your house, first in the form of mud conveyed in on the shoe. There is only one inconvenience attending it: some of the saw dust will find its way into the house, but it is much more easily and pleasantly removed than dirt. It looks clean, and has an agreeable smell when fresh. What great labor it saves in the articles of rubbing and scouring, and prevents, in a great measure, the confusion in flying from dust every morning, whenever the broom is touched, or be stifled to death—and then the bad coughs, and consumptions it prevents, and cases improperly called cases of poison. I verily believe, many people die of dirt. I have gone to places before now, where, on retiring to bed, and lifting the coverlet, I have been nearly thrown into a quinsy, by rousing the sleeping dust which had gathered about the bed. And what clouds of dust arise from moving a carpet; and when cautiously removed, you may write your name with your finger on the floor off of which it is taken. This is all brought about by not guarding the outposts of the chamber by suitable walks, such as I am recommending. What scolding and bawling, and rattling of bells, and fluttering of turkey wings, it would save, (if those simple means were used,) which are almost as bad as the dust itself! For no decent woman can hold her peace while her eyes and nose are weeping and sneezing, from being filled with dust; and no man can be easy while his wife is in pain. And, alas! the poor servant maid that is doomed to the broom, every morning of her life, she seems in some sort to be fulfilling the decree, 'dust thou art, and to dust thou shalt return." Every lady, of improved mind, sets a high value on her library: how can she endure to have her neatly bound volumes soiled with dust? But the gilded cover, the elegant type, and the purest sentiment, are not secure from the intruder, and even the family bible is not exempt from its all-defiling approaches. The waxed floor, the bright furniture, the washed apparel, are all in their turn assailed by this enemy of neatness, so that it may be considered as the most formidable impediment in the way of comfortable housekeeping, and the greatest pest of the well-bred lady. Now the saw dust which I am recommending, spreads an air of neatness, purity, and brightness, through every department of the mansion house, dispels many an angry look, promotes health, cherishes love—in short, it imparts new vigor to all the domestic virtues.

I. R.

A NEW MODE TO DESTROY CATERPILLARS.

To the Editor of the Farmers' Register.

A Yankee friend mentioned to me a mode he had adopted of destroying caterpillars, that he found effectual, which I thought might be new to some of the readers of the Farmers' Register. It is, to blow up the whole colony with a gun loaded with a light charge of powder, choosing such times as they are in their nests. He says, it is sport for the boys, who are willing to do the shooting, he finding the powder. The muzzle being put close to the nest, not one escapes.

W.

From Jacob's Travels in Germany.

AGRICULTURAL ESTABLISHMENT AT MOEGELIN, IN PRUSSIA.

About twelve or thirteen years ago, the King of Prussia, who like his uncle, was always anxious to extend and improve the agriculture of his dominions, invited Von Thaer, who resided near Lunenburg, and whose celebrity was even then great, to settle in his kingdom, to assist in diffusing agricultural knowledge, and, by his management, set an example to the other great landed proprietors, which might stimulate them to adopt similar improvements. His majesty also wished him to conduct a seminary, in which the knowledge of the sciences might be applied to husbandry, for the instruction of the young men of the first families.

The estate of Moegelin was given to him to improve and manage, as a pattern farm. It consists of eighteen hundred Berlin morgens, or about twelve hundred English acres. At that time the annual value was estimated at two thousand rix-dollars,* but is now supposed to be worth twelve thousand; but some part of that increased value must arise from the buildings that have been since erected. The principal improvement, that of the soil, has arisen from the large flocks of sheep, which in summer are folded on the land, and in winter make abundant manure, in houses constructed for their lodging.

The Royal Institution, of which Von Thaer is the director, and which occupies a considerable portion of his extensive buildings, has three Professors besides himself. One for Mathematics, Chemistry, and Geology; one for Veterinary knowledge; and a third for Botany, and the use of the different vegetable productions in the Materia Medica, as well as for Entomology. Besides these, an experienced agriculturist is engaged, whose office it is to point out to the pupils the mode of applying the sciences to the practical business of husbandry. The course commences in September. During the winter months, the time is occupied in mathematics, and the first six books of Euclid are studied; and in the summer, the geometrical knowledge is practically applied to the measurment of land, timber, buildings, and other objects. The first principles of chemistry are unfolded. By a good, but economical apparatus, various experiments are made, both on a large and small scale. For the larger experiments, the brew-house and still-house, with their respective fixtures, are found highly useful.

Much attention is paid to the analyzation of various soils; and the different kinds, with the relative quantity of their component parts, are arranged with great order and regularity. The classification is made with neatness, by having the specimens of soil arranged in order, and distinguished by different colors. Thus, for instance, if the basis of the soil be sandy, the glass has a cover of yellow paper; if the next predominating earth be calcareous the glass has a white ticket on its side; if it be red clay, it has a red ticket; if blue clay, a brown one. Over these tickets, others of a smaller size indicate, by their color, the third greatest quantity of the particular substance contained in the soil. This matter may appear to many more ingenious than useful, and savoring too much of the German habit of generalizing. The classification of Von Thaer is, however, as much adopted, and as commonly used on the large estates of this country, where exact statistical accounts are kept, as the classification of Linnæus in natural history is throughout the civilized world.

There is a large botanical garden, arranged on the system of the Swedish naturalist, kept in excellent order, with all the plants labelled, and the Latin as well as the German names. An herbarium, with a good collection of dried plants, which is constantly increasing, is open to the examination of the pupils, as well as skeletons of the different animals, and casts of their several parts; which must be of great use in the veterinary pursuits. Models of agricultural implements, especially of ploughs, are preserved in a museum, which is stored as well with such as are familiar in Germany, as with those used in England or other countries. I remarked the absence but of two implements used in this country, viz. the mole plough, and a new machine recently invented for sowing small seeds. The first of these would certainly be of little use in most parts of Germany; and the other is so new, that, excellent as it is, its adoption is by no means general, even in England.

The various implements used on the farm are all made by smiths, wheelers, and carpenters, residing round the institution; the workshops are open to the pupils; and they are encouraged, by attentive inspection, to become masters of the more minute branches of the economy of an estate.

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* A rix-dollar is a small fraction less than 3s.

It appeared to me, that there was an attempt to crowd too much instruction into too short a compass; for many of the pupils spend but one year in the Institution; and thus only the foundation, and that a very slight one, can be laid in so short a space of time. It is however to be presumed, that the young men come here prepared with considerable previous knowledge, as they are mostly between the ages of twenty and twenty-four, and some few appeared to be still older.

The sum paid by each pupil is four hundred rixdollars annually; besides which, they provide their own beds and breakfasts. In this country, such an expense precludes the admission of all but youths of good fortune. Each has a separate apartment. They are very well behaved young men; and their conduct to each other, and to the professors, was polite even to punctilio.

As I have not had an opportunity of visiting Hofwyl, and have met with no account of that Institution written by any person who is well acquainted with many details on the subject of its agriculture, I cannot make a comparison between that widely-blazoned establishment, and the unostentatious Institution of Moegelin. I was indeed told that the plan and effects were far inferior; but, as my informants were Prussians, I make some allowance for the national vanity, which felt itself piqued that the establishment in Switzerland should be praised most highly, and their Royal Foundation be unknown beyond the boundaries of the kingdom to which it belongs.

From the Silk Culturist.

FEMALE INDUSTRY APPLIED TO SILK CULTURE.

The following facts are not only creditable to the female industry of the country, but conclusively prove that female labor, when judiciously applied, receives its full reward. Last summer a venerable matron of Franklin county, Pa. seventy-six years of age, with the aid of a girl, in five weeks made and sold silk to the amount of $60, besides attending to the ordinary duties of her household. Two young ladies in the same county, in about six weeks, made silk, sufficient for 4000 skeins of sewing silk, which at five cents a skein, amounted to $200. There are growing in the town of Hebron in this state, eight white mulberry trees from ten to twelve years old, from which silk was made the last summer by two young ladies of Mansfield. They spent five or six weeks in Hebron, and, after paying all expenses of board, &c. carried home $60. Another young lady in Mansfield made silk the last summer at the halves. She made and reeled in nine weeks twenty pounds, worth at least $4.50 a pound. By this it will be seen that her share amounted to $45, and that she received $5 a week for her labor.

We might go on and state facts of this kind, *ad infinitum*: but these are sufficient to prove that female labor, when applied to profitable objects, receives a liberal remuneration. Philanthropists have expatiated at great length, and with much good feeling, on the deplorable condition of females on account of the depressed price of their labor—they express, and no doubt feel, a tender sympathy for females dependent on their labor for support; but, like most others who make less pretentions to sympathetic benevolence, are prone to suffer their commiseration to evaporate in prayers and good wishes for an amelioration of their condition, instead of prompting them to laborious exertions in devising and maturing plans for their relief. It is true, female labor, when compared with male, receives a small compensation; but at the same time it must be admitted that it will always command an equivalent for the value of the services rendered. This disproportion in price grows out of the nature and profits of the object on which labor is bestowed, rather than the amount of skill or physical power rendered. The value of skill and strength is materially diminished by its being inappropriately applied. The skill of a miniature painter would be worth but little if applied to the tarring of fruit trees to prevent the ascent of insects, or the strength of a Hercules, if devoted to embroidery or other needle work, requiring mere dexterity and skill. The only way in which females can increase the value of their labor, is by seeking out objects, on which to bestow it, which yield to themselves and their employers greater returns of profit. Among these, the culture and manufacture of silk, is a prominent one. The services of a healthy female in rearing the silk worm and reeling silk, are worth as much, and will command as high a compensation as those of the most athletic male; but their labor would command but a small price if applied to building stone wall in New England, or clearing the forests of the West,—and for the best of all reasons, it would be misapplied and consequently worthless. The secret of rendering male or female labor valuable and ensuring it an adequate and equitable reward, consists in applying it to objects, not only valuable in themselves, but which are capable of being made the means of accumulating wealth.

From the Silk Culturist.

ENCOURAGEMENT OF SILK CULTURE AND MANUFACTURES IN THE NORTHERN STATES, BY LEGISLATIVE BOUNTIES.

The act lately passed by the legislature of Massachusetts, giving a bounty of $2 on every pound of raw silk grown and reeled within the commonwealth, is one of those master pieces of state policy for which her legislators have long been distinguished. Though it is highly creditable to the intelligence of the members, and the amount disbursed under its provisions will bring forth its "hundred fold;" yet there are probably some, making high pretensions to a thorough knowledge of political economy, who will consider it a profuse, if not a wanton and wasteful, expenditure of public treasure, and be disposed to censure them for a reckless disregard of the public interest. A narrow and short sighted policy would doubtless condemn the law, and all appropriations made under it, as a profligate expenditure of the people's money; while at the same time the political economist, who takes an enlarged and enlightened view of the consequences which must inevitably result from it, will pronounce it the perfection of political wisdom. A detail of the circumstances under which the law was passed, and its effects upon the agricultural and other interests of the state, will show that we are not mistaken in our ideas concerning it.

The culture and manufacture of silk has for a time been engrossing the attention of most of the States in the union, several of which have been endeavoring to introduce and foster it by legislative bounties. In this new enterprise Connecticut led off, by offering a bounty of $1 on every hundred mulberry trees, and 50 cents on every pound of reeled silk. This gave the business a little start, and made Connecticut the most favorable State for engaging in it, on account of the bounty, all other advantages being equal. Massachusetts followed, by offering the same bounty on every pound of reeled or thrown silk. Vermont, seeing Connecticut and Massachusetts filling up with mulberry trees, and inviting the growers of silk to settle within their limits and avail themselves of their liberality, endeavored to attract their attention towards her genial soil and climate, by offering them a still more munificent bounty. An act giving a bounty of 10 cents on every pound of cocoons made within the State, was passed at the last session of the legislature. Maine, also, finding that her soil and climate were adapted to the cultivation of the mulberry, and rearing of the silk worm, and not being content with the avails of her lumber and granite, invited the silk grower to visit her, and as an inducement, in addition to the low price of lands, offered him a bounty of 5 cents a pound upon cocoons. New York was also enticing the Yankees to leave New England and settle in some part of her vast dominions. With these offers before them the silk growers were balancing in their minds the comparative advantages and disadvantages of these respective States, when Massachusetts magnanimously comes forward, and offers them $2 a pound for every pound of silk they will grow, reel and throw, within her jurisdiction, during a period of seven years.

This offer will settle the question, unless the other States pursue a policy equally liberal, and present inducements equally flattering. Without these, Massachusetts will become the great silk growing and manufacturing district of the United States, and wealth will flow in upon her with a flood tide. The bounty will pay all the expense of making the cocoons and reeling the silk, and leave the $4 or $5 a pound, for which it is readily sold, nett profit to the grower and reeler. With this encouragement in Massachusetts, what company or individual will even think of purchasing land in any other State for a plantation? But the consequences will be favorable in other respects. In the first place it will enhance the value of real estate. All lands exclusively devoted to the culture of silk, will be so much withdrawn from other agricultural purposes, and leave the remainder at a proportionably increased value. The manufacturing population of Massachusetts is sustained, at least in part, by the products of her soil; and as this is circumscribed in its limits, its value per acre must rise in the same proportion; and hence every farmer will feel the beneficial influence of the law, though he may never engage in the culture of silk.

In the second place it will increase the population of the State. The liberal provisions of the law will have an irresistable tendency to call in silk growers and manufacturers from States that pursue a more penurious policy. These emigrants will be found of a very different character from those from the "Emerald Isle." They will bring with them a spirit of industry and enterprise —habits of temperance and economy, and a love of morality and good order—they will cheerfully contribute their proportions of money for the support of the government, and deposite their influence in the common stock in support of the laws and institutions of the State.

THE HESSIAN FLY SUPPOSED TO HAVE EXISTED IN FRANCE.

To the Editor of the Farmers' Register.

A few days ago, I accidentally found an extract, which, twenty years ago I had made from an agricultural work which I happened to open. It is as follows:

"There is a small kind of worm, which gets into the roots, chiefly of oats, and, working upwards, destroys all the inside of the plant, which perishes soon after. I suspect it to have been an insect of this kind that destroyed so much wheat in the neighborhood of Geneva, and which M. de Chateau-vieux describes thus: 'Our wheat, in the month of May, 1755, sustained a loss, which, even that cultivated according to 'the new husbandry, did not escape. We found in it 'many little white worms, which afterwards became 'of a chesnut color. They post themselves between 'the blades, and eat the stems. They are usually found 'between the first joint and the roots. Every stalk 'which they attacked, grew no more, but became yel-'low, and withered. The same misfortune happened 'to us in the year 1732. These insects appeared about 'the middle of May, and made such havoc, that the 'crop was almost destroyed.'"

[*Duhamel's Husbandry, page* 86.

Now, sir, was this insect the Hessian fly? If it clearly was not, please throw this communication into the fire. But if it is either certain, or probable that it was, the publication of my extract may be valuable. In the first place, it seems to me important to preserve every fact illustrating the history of this scourge of American agriculture. To ascertain and record facts as to the history, nature, and habits of this insect, would probably afford to some inquiring mind, a hint which might lead to the discovery of some means for its extirpation. But, in the second place, if the Geneva insect be the Hessian fly, should not our intelligent agriculturists seek for a more full and detailed account of the facts stated by M. de Chateau-vieux? Might not such an inquiry result in bringing to light the usual modes of agriculture, or the special means used on those occasions, by virtue of which, the visits of the insect in question were so promptly arrested? Could not the Editor of the Farmers' Register avail himself of his correspondence with French agriculturists to gain this information? Or, if that correspondence is not yet sufficiently general, might not the distinguished Virginian who represented our country at the French court, and who has in the inquiry, not only the general interest of an American patriot, but the more special and personal interest of an Albemarle farmer—might not he institute that inquiry with as bright a prospect of success as would be open to any one at this late day? If in this way the interests of American agriculture could be promoted, it would doubtless gratify him highly thus to benefit his country.

A. B.

Although it was long the prevailing (and scarcely questioned) opinion, that the Hessian fly was of European origin, and was first brought to America in the straw beds of the Hessian soldiers employed in the revolutionary war, that opinion seems to have yielded to one entirely opposed, namely, that this insect was altogether unknown in Europe. This last opinion seems sustained by strong indirect testimony, in this respect, that if the fly existed in Europe at all, its ravages would certainly have been heard of, and to great extent—whereas, no such evil is mentioned by authors, among the many to which the wheat crop is usually subject. This objection to the existence of the fly in Europe is not removed by the quotation furnished by our correspondent: but it must be admitted that the description agrees so closely with that of the Hessian fly, that if taken alone, there could be but little doubt as to its being the insect there described. The passage is at least curious and interesting—though it had escaped our observation in a former perusal of this work, and, also, probably the observation of other farmers, and has been first noticed by our correspondent, who has no practical acquaintance with farming.

But though we shall rejoice to have agricultural inquiry in general extended, and consider the exchange of information between this country and Europe especially wanted, it is not believed that any inquiry as to the disappearance of this insect could lead to any valuable result—or that it could compare in importance with hundreds of other matters on which information might be obtained, but for the want of suitable intercourse. The plagues of different insects have prevailed to great extent, at many times, and have afterwards ceased, as suddenly, and as unaccountably, as they first arose and spread. Such a case occurred in the alarming numbers and ravages of the chinch bug, some dozen years ago in part of Virginia, which, by their increase, threatened destruction to the crops of both corn and wheat—but which disappeared after two or three years. Another case is presented in the next succeeding page of the work which our correspondent quotes from, in a passage which shows very clearly, (notwithstanding the ignorance of facts, or false reasoning displayed,) that the common *moth-weevil* of Virginia was once very destructive to wheat in France. Yet that insect is not known at most times as a cause of injury in Europe; and within the last two years, the same scourge has again appeared, and seems to be considered (under the name of *alucite des grains)* as a new foe to agriculture—and the investigations of agricultural societies, and their offers of premiums, have been directed to obtain knowledge of the habits, and to stay the ravages of this insect. Seeing that the description, in recent French papers, agreed fully with the moth-weevil, and believing that the articles on that insect in vol. I. of the Farmers' Register, were both correct and convincing, as to its propagation, and the means of preventing its ravages, we attempted to convey these papers to the Central and Royal Agricultural Society of France: but whether they were never received, or were deemed of no importance, there has been no notice taken of them in the proceedings of that Society. But this is a digression from what was designed—which was to copy from Duhamel the evidence that moth-weevil, formerly existed in France, and was very destructive. The passage which follows, is part of a letter to Mr. Duhamel, from a gentleman of Angoumois.

“ ‘The great loss, which we have suffered in this province in our corn, and especially our wheat, for seventeen or eighteen years past, has put us upon making strict inquiries into the causes of a corruption with which our grain is infected. The common opinion is, that when the corn is in bloom, that is to say in the month of June, small white butterflies lay their eggs in the flowers. When the grain is ripe, the eggs are enclosed in it. As soon as the corn is laid up to be kept, it is found to ferment. This fermentation raises a heat, which hatches the eggs, whence little worms proceed, which are transformed into chrysalides, and these are afterwards metamorphosed into little gray butterflies, or moths. In this state they quit the grain, which is then void of flower. This insect not only spoils the grain in which it is hatched, but likewise communicates a most disagreeable smell to all the grain near it; a smell which is sometimes so strong and nauseous, that fowls, and even hogs, will not eat the grain.

“ Others impute it to the maize, or Turkey wheat, which is sown in great quantities in this province, and which spreads its roots so far, and so impoverishes the earth, that other corn sown after it, in the same ground, can find no nourishment. This is not probable: for it could only alter the quality of the grain, but not bring on an entire putrefaction.—The two following experiments were tried to prevent it.

“ A farmer had three or four acres of land which had been under grass for more than sixty years. He had ploughed and dunged it well. He had his seed from Poitou; and, in short, took every precaution to guard against this contagion. The wheat ripened and was very good. He cut it down in a dry season, thrashed it in the open air, and cleansed and winnowed it very carefully. It was laid in a granary which had no communication with any other, and which had an opening to the north. The farmer ordered it not to be laid above three inches thick on the floor, and to be turned twice a day. Four days passed before the least heat was perceived; but on the fifth day, it began to grow a little warm; and from that time the heat increased, notwithstanding every means that had been, and still continued to be used. All that could be done, was, to prevent its being so much spoilt as corn in general was that year.

“ The other experiment succeeded better. As soon as the wheat was thrashed, well cleaned and winnowed, it was put into an oven heated to a certain degree. The floor of the oven was covered with wicker hurdles, on which the corn was spread four inches thick: the door of the oven was then shut, and remained twenty-four hours without being opened. Many have followed this example. Their grain has not changed: only its color is not so bright. Care must be taken that the oven be not too hot: otherwise, the bread made of this flour will have a burnt taste. It is likewise necessary to cover the bottom of the oven, lest the wheat should comunicate its taste to it.

“ I confess that this operation is long and troublesome, where a great quantity of corn is to be preserved; for only ten or twelve bushels can be put into the oven at a time: and besides, it must be done the moment it is thrashed; otherwise it will infallibly spoil.’ ”

Extracts from the Philadelphia Agricultural Memoirs.

WOOLLEN RAGS AS MANURE.

"The roots of plants naturally possess to a considerable degree the power of producing decomposition, as I have had occasion more than once to observe in the case of planting potatoes with woollen rags instead of dung. I have seen fine crops of potatoes raised by dropping a small piece of woollen rag not larger than the hand, in the furrow along with every set of the potatoes when planted; and I have observed, when the potatoes were gathered in the fall, that in every instance where a potatoe plant had failed to vegetate, the rag was turned up entire, very little damaged by being buried under ground; whereas on the other hand, not the smallest vestige of the rags were to be seen in any part of the ground where the plants had succeeded and grown to perfection."

"Before the revolution war, I collected many cart loads of tailor's rags, chiefly woollen. Some I had cut in small pieces; others were ploughed in as they came from the shops, after having been scattered by hand so as barely to cover the surface of about three acres of loamy land, much worn. I had a remarkably fine crop of potatoes, succeeded by a great crop of wheat. On this clover was sown. It lay for many years without other manure except plaster, in green grass after the clover. The effect of the rags continued longer than that of any manure I ever experienced.

From the Farmer's Magazine.

ON DRILLING CORN [OR WHEAT.]

Letter from Mr. Checketts of Belgrave-Hall, near Leicester, to the Right Honorable Sir John Sinclair, Bart.

February, 1821.

Sir: In answer to your letter, I am happy to inform yon of my success in drilling. If I were to deviate from this system, I could not withstand the bad times that the farmers now experience. I drill every kind of grain; and have drilled Swedish turnips, for the last five years, on ridges, in the manner you pointed out; but, owing to the late dry summers, I have been under the necessity of working the ridges down to a flat surface with my horse-hoe which keeps the moisture from evaporating more than the high ridges. The greatest weight I ever grew with the drill on ridges was twenty five tons per acre; and at the same time, in the same field, broadcast, fifteen tons to the acre. About the time I last wrote to you, my neighbours were beginning to follow my system of drilling.

At the present time, every farmer near me drills his corn, (rows from five to seven inches,) even those that were prejudiced against the system before they tried it.

The man whom I set up with a drill, continues to go from village to village with the drill, to many different farmers, to drill their corn, by the acre. The third year he said he would sell it, for every village at which he drilled, the wheelwrights and blacksmiths were taking patterns from the drill, for the purpose of making others; and that he should meet with no employ the year ensuing. I desired him not to sell it, for that showed him the system was gaining ground, and he would meet with plenty of fresh customers, which was the case; and this last year was his best. He drills wheat, barley, and oats, from five to seven inches asunder, at two shillings per acre; beans, peas, &c. at twelve inches, at one shilling per acre; the farmers finding a horse, and a boy to lead.

I have at this time an enclosed piece of strong clay land, of four acres, in a high state of cultivation, that has been alternately wheat and vetches for ten years. It joins my farm-yard; and I believe I could not put it to a better purpose. The vetches are always carted into the farm-yard in a green state, for the farm-horses and others; at the same time keeping the yard littered with stubble, or what I can spare for that purpose. The wheat and vetches are always drilled, and well hoed in March and April. The wheat I always harrow, and hoe in thirty bushels of soot per acre. In the year 1820 it was wheat; and the four acres produced four loads of wheat in the sheaf to the acre, each sheaf one yard round at the band; each load 10 threaves of 24 sheaves to the threave; and each threave produced one bushel;—which is five quarters to the acre. The four acres are at this time drilled with vetches, and in spring will undergo the former process; and as each land is cleared of the vetches in summer, it will be ploughed up to prepare for wheat.

I have at this time a great quantity of soot in a good dry shed, for which I gave 6s per quarter. It gains strength by keeping in a great bulk; moreover, it sells for 8s. a quarter in the spring. This is a sufficient inducement to lay in a stock in the autumn and winter.

I grow the small Heligoland beans in preference to the large sort. They are tougher in the stem, snd will allow the horse and hand-hoe to be worked better amongst them. They also produce more quarters per acre, are harvested sooner, and allow the land to be sooner ploughed up for wheat; which is a great advantage for the ensuing crop. I was successful last year in growing Talavera wheat; drilled the latter end of Febuary, after Swedish turnips drawn off to the grass land, —a great and good crop, full six quarters to the acre. In December, 1818, I drilled Talavera wheat after Swedish turnips. I had upon this an amazing crop of straw, seven feet high, and little good corn. I now sow the Talavera wheat on my weakest and dryest soils.

I employ ten regular labourers on my farm. I allow them, according to their families, a proportion of land (that I intend drilling wheat on at Michaelmas), upon which they grow potatoes enough for their winter consumption. The potatoes are planted in drills, in the same manner as turnips on ridges. It is a pleasant scene of industry to behold the men, their wives and children, on the day of planting: Every one gets his potatoes cut for that day; the double shieldboard plough opens the ridges; the carts bring the manure; all flock to assist in depositing it; all join to help each other to drop the potatoes on the manure; the men follow with a large hand hoe to cover it and the potatoes; they thus proceed to another lot of ground, till all is finished. This is a great assistance to them; for in this village, garden land is scarce. When the potatoes grow high enough to be seen; a narrow walking horse, or pony, works the horse-hoe between the rows, to clean and pulverize the soil; and the hand hoe follows, to clean in the rows between each plant. After a time, the clogs are put on the shares of the horse-hoe, to mould them up with the fresh soil. I know of no way so cleanly and good to grow this useful and valuable root; and under this system the land is kept clean from weeds, and well pulverized, and will produce a good crop of wheat equal to a dead fallow.

I never knew a farmer leave off drilling who placed his rows near enough together, and allowed plenty of seed to the acre.

There is no machine deserves encouragement more than the drill, for many reasons. It encourages industry; it grows a greater quantity of corn to the acre, of better quality; it employs the poor in the spring, and the extra produce of the crop pays them; no weeds are allowed to seed and fall to the ground, nor to grow so as to impoverish the land. I am certainly of opinion that one crop of weeds exhausts the land more than, or equal to, three crops of white straw.

The price I pay for hand-hoeing is 4s. per acre for wheat, 3s. 6d. for barley and oats, and 6s. for beans; the wider in the rows, the more it is worth for hoeing. The hoes cost 2d. an inch.

To encourage the drill against broadcast, I have offered the farmers to divide a field of clay land into two equal parts, and that I would drill in the crop and hoe it at my own expense; and that I would have nothing but the extra produce for my trouble and expense. My offer has never been accepted. I have therefore never had the pleasure of a trial, except on my own farm, which is good wheat land; and, on the average, produces one quarter to the acre more than broadcast.

I am, &c.

THOS. CHECKETTS.

ON THE VALUE, AND MODE OF CONSTRUCTION, OF MUD WALLS, FOR FARM BUILDINGS AND ENCLOSURES.

To the Editor of the Farmers' Register.

Surry, Va., May 31, 1836.

I believe no one has given to your very valuable publication, any account of the mode of constructing mud walls for fences and houses; and as I am at this time constructing half a dozen houses with such walls, for negro quarters, upon the place of my present residence, and having also seen much of this kind of building, I have thought that a short sketch of the plan of such houses, the mode of constructing them, together with some account of the results of experiments made some eight or ten years since in this kind of structure, might serve to call the attention of the public to it, as something novel indeed in this country, but at the same time as affording for permanent enclosure, in the absence of ordinary materials, one of the cheapest and most durable substitutes; and for farm houses perhaps the very best material that can be found to fulfil at the same time all the conditions of fitness, durability, cheapness, and appearance. I will premise, however, that I am not going to speak of *pisé* or *dirt walls*, of which the public have heard so much. Mr. Herbemont of South Carolina, has given in the 1st vol. of the Farmers' Register, a high commendation of *pisé* as a material for constructing houses and fences, but he seems to recommend pisé chiefly for permanent enclosures where wood and stone are either too costly, or not to be had: and the South Carolina "Society for the Diffusion of Useful Knowledge," in the 3d vol. Farmers' Register, No. 8, also recommend pisé as a mode of constructing houses and fences. I shall not pretend to question such high authority—still less should I be inclined to add any thing to the much that has been written upon pisé, a mode of building which is said to have its origin traceable back to the days of Rome and Greece, and which is said in the address of the South Carolina Society, above alluded to, to "be "the subject of a full article in a work of great au-"thority, the *Cours Complet d'Agriculture*, by the "Abbé Rozier, assisted by some of the most scien-"tific men in Europe," and by Mr. Herbemont himself, that "there is a full description of the "manner of building pisé houses and walls, to be "found in one of the volumes of the American "Farmer of Baltimore, and in Rees' Cyclopædia. "It may also be probably found in several other "books." I have mentioned these authorities upon the subject of pisé, chiefly that the subject may be the more readily investigated by those who desire to compare it with what I shall call *mud walls*, and I would invite this comparison, especially by those who have read Mr. Herbemont's article in the Register above referred to; because I think he has there, in his zeal for pisé, opposed the influence of his name too hastily to the introduction of the more simple and humble, but not the less useful system of "mud walls," when he says, "this mode of building (*pisé*) must not be "confounded with what are called 'mud houses,' "and which are inferior in every respect"—if indeed Mr. Herbemont meant here to refer to the kind of mud wall which I shall describe.

I have been unable to ascertain the origin of the mud wall mode of building. Rees' Cyclopædia is silent upon the subject, with the exception of the following remark under the head of "Walls." "Rammed earth walls, as well as those formed of "muddy clay, answer very well in some intentions, "being very close, compact and warm." Loudon in his "Cyclopædia of Cottage, Farm, and Villa Architecture, &c." p. 77, gives the mode of building the mud walls of cottages in Cambridgeshire, England, but this process is totally different from the one I shall describe. General John H. Cocke of this State, constructed the first mud walls for houses and enclosures which I have ever seen or heard of in this country, and in answer to some inquiries lately made of him upon this subject, he writes: "I know of no person in our country who "has built mud walls but myself. It was not an "original conception of mine, it having been in use "for centuries in Europe. I was put upon it from "reading of it in agricultural and rural economy "books; and finding a Welshman in my neighbor-"hood, 15 or 16 years ago, who had been accus-"tomed to making walls of that description in "Wales, I made my first experiment with his as-"sistance, shortly after that time, upon a farm "yard wall, which is now as firm as it was the day "it was put up." So you see, Mr. Editor, I shall be unable to attribute to my mud walls the antiquity of Greece or Rome, or to recommend them to the public notice by citing any learned treatises upon them by learned men. I regret indeed that they have no such aid, for I verily believe they merit this last as much as pisé—or if they have any such aid, that my ignorance renders me unable to adduce it. But be all this as it may, I will now proceed to state the *results of some experiments* with mud walls for houses and fences, and then explain the *mode of construction*, so that an intelligent public may judge if there be really any thing valuable in this mode of building, and that those who choose to practice it, may have the few simple rules required to guide them.

The farm-yard wall mentioned above in the extract from Gen. Cocke's letter, forms three sides of the enclosure of a barn yard upon the Bremo estate. It was put up about the year 1820 or 1821, is based upon a rough stone foundation without mortar, or upon what is called dry masonry—the foundation wall being about 20 inches wide, and rising 6 inches above the surface of the earth. The wall is about 7 feet high, and covered with common pine slabs nailed upon a rough frame in the form of a roof. This wall is perhaps more perfect than it was when first put up, having become harder with the lapse of time. I have never known a mud wall built without a stone or brick foundation, but I am decidedly of opinion, that one would stand well without any such expensive aid, if built upon a tolerably dry locality, nor do I think the wood capping or covering by any means *essential* to that degree of preservation which simple utility (and not appearance,) would require. I state these *opinions*, however, rather to shew my conviction of the durability of this kind of wall, than from any desire to have them acted upon. In truth, I have in this instance given my opinion when I had only intended to state facts. I hope they will not be confounded. Gen. Cocke has also a stable and a quarter at Bremo with mud walls, which have been standing several years, and are found to answer every expectation. He has also enclosed a lot and house in the village of Charlottesville with a mud wall, which has been standing eight or ten years without injury.

Upon my four plantations in the county of Brunswick, there are upwards of thirty mud houses, (each double 19 by 30 feet, with a stone chimney in the middle,) for negro quarters, besides overseer's houses of larger size. These houses are however all plastered on the outside with lime mortar. The first of them were built about eight years ago, the others successively added until they were all completed about the year 1832. None of these houses have since required any repair—the walls promising to stand as long as the roofs are kept upon them. They constitute, I venture to say, the handsomest improvement in the way of farm houses, to be found in the State of Virginia, and cost the estate not the outlay of one cent, except for the trifling article of nails, and have been found to reduce, for several years past, the doctor's bills to a most felicitous *caput mortuum*. In building these houses, a good stone mason belonging to the estate constructed the chimneys and foundations of *stone*, an abundance of which was found at hand; and with his aid and under his direction, the ordinary plantation hands put up the walls, a coarse negro carpenter executing the wood work. Sheer truth and justice, however, require me to state, that all these improvements were made under the eye and superintendence of the very intelligent and enterprising steward of the estate, Mr. Richard D. Powell, according to instructions given him.

A *suitable soil* is a prerequisite to the use of mud walls; any soil, however, will do for this purpose which will make pisé, or brick. A pure clay will do, but this is not so good, being liable to crack in in drying. A soil of clay and sand in proportions of one of the former to two of the latter, is I think the best. But lest some imaginary difficulties might arise here in the minds of some as to the necessary qualities of the soil to be used, I will state it as my belief, resulting from experience, that almost any soil will answer well which will make a good stiff mud, such as is every where known to be used by negroes in daubing or chinking their houses, and which may be found upon most plantations in ninety-nine places out of a hundred.

When a mud wall is to be built, a *foundation* of dry masonry or brick must be previously prepared by any rough mason, rising six inches above the top of the ground, and as deep below as the nature of the soil may require. The foundation wall will usually be 20 inches thick. At a distance of three feet from the outside base of the foundation wall, draw a line parallel to the wall, and throughout its length; lay off six feet from this line and draw another, parallel to it upon the ground. The space included between these two lines is to be spaded up to the depth of 9 inches; and then, after a good rain, or after adding water, hauled if necessary for the purpose, the earth must be worked up into a stiff mortar or mud, by treading it with oxen. This done—which indeed may be considered well done when the mud would be thought half prepared even for coarse bricks—the three men who are required in the operation, each with a spade makes a layer, a *spade full* thick, of the mud upon the *berm*, or margin next the wall. As soon as this is done, one of the men with an arm full of sound *wheat straw*, begins at one end of the layer and spreads the straw before him upon the mud, walking upon it as he passes along, and having it just thick enough to prevent the mud sticking to his feet as he passes on. A second layer of mud is next piled upon the straw, then a layer of straw, then mud, &c. until the mud first prepared is laid in a pile upon the berm, with the straw distributed through its mass in the manner just described. The next operation is to commence the wall. For this purpose, two men are provided each with the common manure fork of iron with three prongs, and a handle of four or five feet. One of these men stands upon the pile of mud, the other upon the wall—the first with his fork places the mud upon the wall in reach of the man there, who with his fork takes it up and throws it strongly into its place. This process is continued until the wall is raised about *three* feet, and extended some three or four feet in length, when another man with a common spade, ground to an edge, cuts off the mud which overhangs the foundation wall, making the corners of the wall square and plumb, and the sides plane. Should it be desired to give the wall a smooth surface, a second trimming with the spade would be advisable after it has had time to dry a day or two, when it would be found to trim much more evenly; and the man who trims should be guided by a *plumb and straight edge*.

The first course of the wall being thus finished, it must be left a few days to dry, and become hard enough to bear the superstructure. In the mean time, the mud may be prepared in the same place and as before, and the process thus continued until the required height is attained, raising the wall at each layer about *three feet*. Some little experience will be required, to teach the proper degree of stiffness to be given to the mud to prevent its slipping when first put upon the wall, and that it may be cut easily by the spade.

My quarters are, I think, of a good size, and of an economical form—each roof covering two tenements; these last having each an interior space of 16 by 13 feet ; a brick chimney in the middle giving a fire-place to each room. The houses are generally placed with their gables to the east and west, with a door to the south, and windows in the north side, the better to exclude the sun and let in the air in summer. They are placed on a street 100 feet wide, and the houses upon the same side of the street 60 or 70 feet apart, as a security against the progress of fire. They have all plank floors, which certainly contribute to health when a marl floor cannot be had. All my houses are plastered on the outside, but I am perfectly satisfied that this is unnecessary except for appearance sake; and perhaps whitewash occasionally applied would be all that is necessary even to secure a good appearance. In putting the roof upon a mud wall, a plate of timber 5 by 20 inches should be first placed upon the wall, properly framed at the corners, upon which the joists are to be placed, and then the roof constructed as usual, taking care to have an eave of about 1 foot projection. The door and window frames are made of three inch plank, having the width of the wall; and framed to the proper size. These are placed on as the wall progresses, and the mud built up to them.

PHILIP ST. GEO. COCKE.

Surry, Va., May 31st, 1836.

Extract from the Edinburgh Review, of Jan. 1836.

PROGRESS AND PRESENT STATE OF AGRICULTURE IN GREAT BRITAIN.

* * * * *

It results from the previous statements—1st, That the population of Great Britain has been considerably more than doubled—that the prodigious number of *nine millions* of individuals have been added to it, in the interval between 1755, or 1760 and 1831. 2d, That the supplies of corn, and other raw produce obtained from Ireland, are quite insufficient to provide for the increased number of horses kept in the country at present, over and above those that were kept in 1760. 3d, That the population is now, and has been for some years past, incomparably better fed, consuming a much greater quantity of wheaten bread and of butchers' meat, in proportion to its amount, than in 1760, or at any other period of our history. And 4th, That the ports have been shut during the last four years: and that consequently, the vast additions made to the population, and the signally improved mode of living, have both been provided for by the extension and improvement of British agriculture. There is not one of these propositions liable to either cavil or dispute—they are all bottomed upon unquestionable evidence. And, having established them, we shall now briefly inquire into the nature and influence of the more prominent of those agricultural improvements, the result of which is, in the aggregate, so astonishingly great.

1. Enclosures are, probably, entitled to rank amongst the first of these. The extent of land occupied by wastes, commons, and common fields, about the middle of last century, was surprisingly great, and was, indeed, a standing reproach to the country. So late as 1770, fully three-fourths of the surface of Bedfordshire consisted of common fields, and of common or waste land, and yet it was not, in this respect, at all in a worse condition than many other counties. Wastes and commons are not cultivated; fields are, it is true, subjected to the plough, but property in them is so much subdivided and intermixed, that it is altogether impossible to cultivate them to any good purpose. But since the conclusion of the treaty of Paris in 1763, a wonderful progress has been made in wiping off the stain on the rural economy of the country; and in nothing, indeed, has the progress of improvement been more remarkable than in this particular. The first enclosure act was passed in the reign of Charles II. From the revolution to 1797, the progress was as follows:

	Acts passed.	Acres enclosed.
Queen Anne's reign,	2	1,439
George I., - - -	16	17,660
George II., - - -	226	318,778
George III. to 1797,	1,532	2,804,197

It appears from this statement, which is taken from the Report of the 'Commons' Committee of 1798, on Waste Lands,' that each enclosure act that passed during that period of the reign of George III., which terminated with 1797, enclosed at an average, 1830 acres. Now, the official returns show that from 1798 to 1832, both inclusive, 2103 enclosure acts were passed; and supposing each to have enclosed, as before, 1830 acres, the total would amount to 3,848,490 acres; making when added to the quantity enclosed previously to 1798, an aggregate of no less than 6,652.687 acres enclosed since the accession of George III. in 1760. But as it seems probable that the earlier acts applied to a larger extent of land than the later ones, we may, perhaps, estimate the total extent of land enclosed and subdivided by act of Parliament, from 1760 to 1832, at 6,000,000 acres. And it may be safely affirmed, that, in consequence of its enclosure, the produce of this immense extent of land has been increased at least from *eight to tenfold.*

2. The instoduction of falllows between successive corn crops, was a very great improvement on the previous practice; but the substitution of green crops for fallow, on all but stiff clay lands, has been the greatest of all improvements ever made in agriculture: and has effected as great and beneficial a revolution in it as the introduction of the steam-engine and of the spinning-frame has done in manufactures. There is abundant evidence to show, that the culture of turnip, as a field crop, was carried on to some extent in several English counties, in the latter part of the 17th century. But the practice spread only by very slow degrees; and it was not till its introduction into the county of Norfolk, in the reigns of George I. and George II., when it was prosecuted on a large scale by Lord Viscount Townshend and others, that its signal importance became obvious. At the period referred to, the whole northwestern part of that county, which has long been one of the best cultivated districts of the empire, consisted of mere sandy wastes, sheep-walks and warrens, worth

little or nothing. These were converted into highly productive arable land, by enclosing, marling, and the aid of turnip-husbandry, which is, as it were, the corner stone of the Norfolk, or improved system of husbandry. The same practices that had produced such splendid results in Norfolk—that had made sandy wastes yield the most luxuriant crops of wheat and barley—have been gradually extended, with similar effects, to many other parts of the kingdom. The produce in corn of the light soils, in all the moderately well-cultivated districts of the empire has, in consequence, been more than trebled; at the same time that a vast supply of green-food has been obtained for the feeding of cattle and sheep, and the production of the most valuable manure.

3. But signal as has been the improvement in arable husbandry since 1760, the improvements made in stock-husbandry, or in the breeding and fattening of cattle, have been still more considerable. No efforts for this purpose seem to have been made with judgment, and proper perseverance, till after 1750, when Mr. Bakewell, of Dishley, in Leicestershire, began his career. Mr. Culley, of Northumberland, soon after entered on the same course; and the signal success by which their efforts were attended, roused a spirit of emulation in a host of others. But the rapid increase of manufactures and commerce, and, consequently, of the town population, after the peace of Paris, in 1763, by creating a corresponding demand for butchers' meat, gave the principal stimulus to the improvements that have since been made in stock-husbandry. It is not easy to over-rate their importance. We have already seen that, at an average, the weight of cattle and sheep has been a good deal more than doubled since about 1750; so that a stock of 5,000,000 head of cattle, at present, would be more than equal to one of 10,000,000 at that epoch. But the number, as well as the weight of cattle, having been very materially increased in the interval, the supply of butchers' meat must have increased in a corresponding proportion, or been at least trebled. There has also, owing to the same cause, been a very great increase in the product of wool. The supply of the latter article, produced in England and Wales, in 1800, was estimated at about 384,000 packs, of 240 lbs. each. But owing to the increased size of the animal, and the greater weight of the fleece, the same number of sheep that produced 384,000 packs in 1800, were estimated by the best informed wool-growers and wool-staplers, to produce 463,000 in 1830, being an increase, in the interval, of no less than 20 per cent.* It is true that the quality of the wool has rather deteriorated, for it seems to be impossible to procure both a heavy and a fine fleece. Taking, however, the increased weight of the carcass, and the increased weight of the fleece into account, sheep are believed to be more profitable at present, than at any former period; and for the last three or four years, they have been the most productive species of stock kept in the kingdom.

It would be curious to trace how, in husbandry, as in other things, one improvement grows out of, and is dependent on another. The grand improvement in modern agriculture—that by which it is mainly distinguished from the old—the universal introduction and superior management of green crops, may be in no considerable degree ascribed to the anxiety of the farmers to procure an abundant and suitable supply of food for their stock, the increased demand for the latter being as already stated, occasioned by the wonderful growth of commerce and manufactures.

The superior attention paid to stock husbandry, in England may, also, it is probable, be to some extent ascribable to the circumstances of the Tithe pressing with comparative lightness on pasture land; whilst it falls with its full weight, on arable land, and operates powerfully to prevent the outlay of capital upon it. But however accounted for, there can be no doubt, that in all that belongs to the breeding and and rearing of cattle, horses, sheep, and pigs, the English are, at present, superior to the Scotch, and to every other people.

It may be worth while to remark, that much injury has arisen from injudicious attempts to improve native breeds of cattle. This has generally been occasioned by prematurely endeavoring to increase their size, which is always determined by external causes, such as the climate, the quantity and species of food the animals can readily obtain, &c. It is to the immensely increased supply and better quality of food, that the increased weight of our cattle is principally to be ascribed. An improved system of breeding would have improved the symmetry of the cattle, and increased their aptitude to fatten; but, without an increase of food it would not have materially added to their size. In point of fact, too, the latter is an inferior consideration. The grand object that the prudent agriculturist should keep steadily in view is the obtaining of the greatest possible return for his outlay; and he will prefer that kind of stock, and that breed, of any kind, that will pay him best for the food consumed. The value to which an animal may ultimately be brought, is a subordinate consideration; the profits of breeding, as of every thing else, being determined, not by the absolute price of the produce, but by its price as compared with the expenses incurred in bringing it to market. Mr. Culley's opinion is, that of all animals, of whatever kind, those which have the smallest, cleanest, and finest bones, are in general the best proportioned, and covered with the best and finest grained meat; I believe they are, also, the hardest and healthiest, and most inclinable to feed; able to bear the most fatigue, while living; and worth the most per pound, dead.* It is certain that animals, whether too large or two small, will gradually accommodate themselves to the size best adapted to their pastures; but while the larger animal becomes unhealthy, and degenerates in its form and valuable properties, the smaller animal increases in size, and improves in every respect.

The preceding remarks apply exclusively to England and Wales. But though the progress of agriculture there, since the middle of last century, has been exceedingly rapid, it has been slow compared to its progress in Scotland. Previously to the peace of Paris, in 1763, agriculture, almost every where in Scotland, was in the most barbarous and depressed state imaginable. There was no rotation of crops; fallows were unknown, except to one or two counties; the process and implements were alike wretched: great numbers of cattle perished every spring; the occupiers were in extreme poverty: and famines were every now and then occurring, that sometime laid waste extensive districts. At the beginning of last century, and for long after, lands, even in the Lothians, were uniformly divided into *infield* and *outfield*. The whole manure made on the farm was laid on the former, which was ploughed and cropped without intermission, so long, at least, as it would bear any thing. Neither turnips, clover, nor potatoes had been so much as heard of; but corn followed corn in an unbroken series. In the *Countryman's Rudiments*, written by Lord Belhaven, and publish-in 1723, we are told that the infield of East Lothian, where wheat is sown, is generally divided by the tenant into four divisions, or breaks, as they call them, viz. one of wheat, one of barley, one of peas, and one of oats; so that the wheat is sown after the peas, the barley after the wheat, and the oats after the barley. Here we have a rotation with three consecutive corn crops, and a crop of peas once every four years. As might be expected, the returns were about *three times the seed*. It is of importance, too, to observe, that this trifling return, was obtained at a great comparative expense. At this period, and for about half a century after, there was no instance in Scotland of a plough being drawn by fewer than four horses. Most commonly it was wrought either by six horses, or by four horses and two oxen; and in some of the most backward districts, a still greater number of animals, sometimes as many as ten or twelve, were yoked to it. This was ascribable partly to the awkward and clumsy form of the implement itself; partly to the weakness of the cattle, their diminutive size, and the improper manner in which they were yoked; and principally perhaps, to the ignorance of the cultivators. On the whole, however, the work was at once very expensive and very ill performed; the ridges were crooked and twisted, and so much heaped up in the middle, that a great deal of land in the hollows between them was lost to any useful purpose.*

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* Mr. Luccock's Tables, revised by Mr. Hubbard. See the Report of 1829, on the Wool Trade.

* Observations on Live Stock, p. 222.

About the middle of the century we begin to find symptoms of amendment. In Maxwell's *Practical Husbandry*, published in 1756, an improved system is laid down and inculcated. He pronounces it to be bad husbandry to take two consecutive corn crops; and he informs us, that the best farmers in East Lothian after fallow take a crop of wheat, after the wheat, peas, then barley, and after that oats. This is still very bad; though a material improvement on the practice described by Lord Belhaven. It shows, too, that down to 1757, neither turnips, potatoes, nor any sort of cultivated herbage, formed any part of the system even of the best farmers in East Lothian. The famous Lord Stair is said to have been the first who introduced the turnip culture into Scotland; having raised turnips on his estate of New Liston, near Edinburgh, about the middle of last century. But Mr. William Dawson, tenant of Frogden, in Roxburghshire, has an unquestionable title to be considered as the real father of the improved Scottish husbandry. Being a farmer, and cultivating for profit only, his example had infinitely more influence over his neighbors than it would have had, had he been a landlord. He commenced raising turnips at Frogden, in 1759. They were at first sown broad-cast, but he set about drilling on a large scale in 1763, and his success stimulated others to adopt the same system. Mr. Dawson was also the first who introduced, not long after 1760, the practice of ploughing with two horses abreast without a driver; nor is it easy to exaggerate the obligations the agriculture of Scotland owes to his sagacity and enterprise.* But even in the Lothians, the four-horse plough continued in general use till about 1780; and it was not finally superseded by the two-horse plough for several years after. In the other parts of the country the former kept its footing still longer than in the Lothians. Nothing contributed more to pave the way for this important revolution in the method of ploughing, than the signal improvements made upon the construction of the plough by Small about 1770.

From the close of the American war, the progress of improvement in Scotland has been rapid beyond all previous example. This has been owing to a variety of causes; but principally to the extraordinary progress made in commerce and manufactures, since that period. In the distracted state in which Scotland was formerly placed, there could be no considerable progress; but, after the battle of Culloden had extinguished the hopes of the Jacobites, and the abolition of hereditary jurisdictions had paved the way for the introduction of a regular system of government, a spirit of industry and enterprise began to be diffused on all sides. A good many branches of trade and manufacture carried on in England were introduced into Scotland soon after the peace of 1763; and not a few of them were prosecuted with much success. Their progress was checked for a while by the American war; but after the treaty of Paris, in 1783, they acquired more than their former vigor: others were introduced, and all of them have since continued, with few, and those but transient interruptions, to advance with a rapidity that could not previously have been supposed possible.

This unprecedented extension of manufacturing and commercial industry, occasioned a corresponding increase of wealth and population, particularly in towns and villages. Improved accommodations of all sorts began to be in universal demand; and, besides the greater quantity of the inferior sorts of food required to supply the increasing population, a novel, or at least a vastly increased market was opened for wheat and butcher meat. These circumstances had the most astonishing influence over agriculture. The new, and constantly increasing markets, established at their very doors, stimulated the farmers to put forth all their energies, and to avail themselves of discoveries and practices to which they had hitherto been total strangers. In a few years the face of the country was completely changed; and its productive capacities increased in a degree that the most sanguine projector of any previous period could not have conceived possible.

The following statement of the comparative weight of the produce annually afforded under the system of farming followed in East Lothian, as described by Lord Belhaven, and that which is now followed, is taken from a paper by Mr. Oliver of Lochend, near Edinburgh, one of the most intelligent practical farmers in the empire.

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* Rural Recollections, p. 196.

* Survey of Roxburgh, pp. 69 and 90.

'The mode of cropping at the former period (1728) was first, peas; second, wheat; third, barley; fourth, oats; the produce being about three seeds, but to prevent all cavil, say four seeds. This, taking the seed for each acre[*] at one boll,[†] over a farm of 100 acres, is 400 bolls. The quantity of straw for each boll of such a crop could not exceed fifteen stones; which, on 400 bolls, give 6000 stones, or forty-two tons, fifteen and one-fourth cwt. of straw to be consumed by the stock, and returned to the land in the shape of manure. But, upon a farm of 100 acres, cultivated as at present, viz. a fourth turnips, a fourth wheat or barley, a fourth clover or rye-grass, pastured or made into hay, and consumed on the spot, and a fourth oats or wheat, the account would stand thus:—fifty acres of wheat, barley, and oats, at eight bolls an acre, which is not above the average of the crops of the best district of East Lothian, and such only was cultivated when Lord Belhaven wrote; this, allowing, as before, fifteen stones of straw for each boll, gives 120 stones per acre, which, over fifty acres, makes in all 6000 stones of straw, being equal to the quantity produced by the whole 100 acres under the old system. Now, suppose that the twenty-five acres of clover and rye-grass are made into hay, which, however, is not the best mode, nor that usually followed, and that each acre yields 200 stones, the total quantity will be 5000 stones, or thirty-five tons, fourteen and one-tenth cwt., and add to this 500 tons turnip, being the produce of twenty-five acres at twenty tons per acre, which is by no means above a fair average crop. Upon these data, the weight of the materials produced annually, as food for cattle and manure, under the old and new systems, will be as follows'—

Old System,	Straw,	6,000 st. or	42 tons	15 1-4 cwt.
New System,	Straw,	6,000	42	15 1-4
	Hay,	5,000	35	14 1-10th.
	Turnips,	70,000	500	

'Thus making the weight of materials for food and manure under the new system, in round numbers, 577 tons, while, under the old system the quantity is only 42 tons, leaving a balance in favor of the new of 533 per annum, being more than *twelve times* the whole quantity produced under the old! Nothing more is necessary to show the superiority of the new system, in so far as keeping up the fertility of the soil is concerned; and upon this depends the progress of agriculture. As to the question of comparative profit, it would be easy to show, from unquestionable data, that the new system is superior to the old in this respect, as it is in the supply of manure; but this must be abundantly obvious to every one who contrasts the almost imperceptible advances made in agriculture, and the accumulation of agricultural capital, for many centuries, with the extraordinary progress during the last fifty or sixty years, or since the new system began to be introduced.'

We have thus endeavored, first, to show, by the increase of population and otherwise, that there must have been a very extraordinary increase in the produce of the soil since 1760; and, in the second place, we have endeavored to point out the more prominent of the modes in which this increase has been brought about. But, before noticing the present state of agriculture, it may be right to say a few words in reference to a statement often made, though really destitute of any good foundation; that is that the wonderful improvements to which we have adverted, were almost wholly owing to the high prices of the late war. But these improvements began both in England and Scotland about 1755 or 1760, and they had been generally introduced, and had made a great progress, before prices sustained the smallest advance. Thus, we have already seen, that no fewer than 2,804,000 acres were enclosed in England and Wales between 1760 and 1797; that that also was the era of the great improvements made in stock husbandry by Bakewell, Culley, &c.; and that during the lapse of the same period, the culture of turnips, potatoes, clover, and artificial grasses was introduced into Scotland, four-horse ploughs discarded, and the most signal revolution effected in the rural economy of this part of the empire of which history has preserved any account. Now, it is of the utmost importance to bear in mind, that, while all this was going on, *from* 1760 *down to* 1795, *prices continued almost stationary*. Thus, taking the Eton market for a standard, the price of wheat, per Winchester quarter, from 1755 to 1795, was as follows:

At an average of ten years, from

1755 to 1765, wheat	£1	19	3	1-4	per quarter.
1765 to 1775, wheat	2	11	3	3-4	per quarter.
1775 to 1785,	2	7	8	1-2	do.
1785 to 1795,	2	14	3	3-4[*]	do.

And had 1795 which was an extremely bad and dear year, been excepted from the average of the last decennial period, prices in it would have been as low as in the preceding. It appears, therefore, from evidence, which is beyond all question, that there was no rise of prices during the thirty years ending with 1795; and yet during that period, above 2,200,000 individuals were added to the population, and agriculture made an astonishing progress. This would have proved conclusively, even though it had not been corroborated by the experience of the last twenty years, that an increasing price of corn is not in any respect indispensable to ensure the continued and rapid advance of agriculture. All that is required to ensure this, is a regularly *increasing demand* for the products of the soil; and this was afforded between 1760 and 1795 by the growth of population, especially in towns and villages. It should also be remembered that, towards the middle of last century, there was, owing the miserable state of the roads, and the difficulty of communication, a great difference in the prices of corn and other farm produce in different parts of the country. But the construction of new and comparatively smooth and level roads, canals, &c., did much to annihilate this difference in the rate of prices; and conferred on the more distant parts of the country advantages that had been hitherto engrossed by the districts in the immediate vicinity of large towns. A spirit of emulation and improvement was in consequence universally diffused; routine practices were thrown aside; and all classes began to make the most astonishing efforts to outstrip each other in the career of improvement.

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[*] The Scotch acre, equal to 1.261 imperial acres, is here referred to.

[†] An East Lothian boll of wheat is equal to near four bushels; a boll of barley to near six bushels.

[*] See Table of Prices at Eton, in M'Culloch's *Commercial Dictionary*, Art. "Corn."

It is unnecessary for our purpose to enter into any statements with respect to the causes of the high prices that prevailed during the greater part of the late war; and, particularly, during the half dozen years ending with 1814. They no doubt gave a powerful stimulus to agriculture; its previous progress being not merely maintained, but considerably accelerated.

The heavy fall of prices that took place consequently to the opening of a renewed intercourse with the continent in the autumn of 1814, was as sudden and severe as it was unlooked for by most persons. In the first instance, it was productive of much distress, of the ruin of many landlords in embarrassed circumstances, and of multitudes of tenants paying money rents, calculated on the footing that the prices that had been realized during the proceding six years would be permanent. This, however, was not the situation of the great body of the agriculturists, by whom the fall was comparatively little felt. It was, indeed, supposed by many, that agriculture would certainly retrograde; that a great deal of inferior land would be thrown out of cultivation; and that, unless prices rose again to something like the war level, we should be dependent on the Continent and America for a large portion of our supplies. We question whether any individual had sagacity at the outset to foresee what has actually taken place. There is an elasticity about the industry of a great nation that enables it to recover from the rudest shocks. No inconsiderable portion—we believe we may safely say the greater part—of the wonderful progress made in manufactures and commerce since 1814, is clearly ascribable to the subsequent fall in the price of corn and other articles of food. But it is quite impossible that agriculture can be long depressed, where manufactures and commerce are flourishing; and, in no very lengthened period, it began to revive. The property-tax, which pressed heavily on the land, was struck off; rents were reduced; and the farmers exerted themselves to meet the new order of things by fresh efforts of skill and industry, and by proscribing useless expense. We do not pretend to say that this has been the case in all districts; but there is incontestible evidence to prove, that, taking Great Britain generally, agriculture has been astonishingly improved since 1814. How else could the extraordinary increase of population that has taken place in the interval be provided for? We showed, in an article on the 'Report of the Agricultural Committee of 1833' (No. 118, Art. 1,) that there was either no increase, or none worth mentioning, in the quantity of foreign corn retained for home consumption during the ten years ending with 1830, as compared with the previous ten years; and yet the population increased during that interval from 14,391,000 to 16,539,000. Now, it is impossible that a result of this sort could have taken place without either a very great increase of agricultural produce, or a striking and almost unprecedented falling off in the demand for corn. But the latter supposition is out of question. Instead of there being any decline in the consumption, the statements previously made show, that the fact is completely the reverse; and that the consumption of wheat and butcher's meat is decidedly greater at this moment than at any former period; a result inexplicable on any other hypothesis, save that of a vast improvement having taken place between 1820 and 1830.

Still, however, the Agricultural Committee of 1833, and by far the greater number of witnesses examined before it, labored hard to prove that agriculture was in a depressed and declining state; that the capital applied to the soil was rapidly diminishing; and that a great diminution of supply might be confidently expected. We endeavored to show, in the article referred to, that the complaints in question were certainly very much exaggerated, if not altogether unfounded. The experience of the two additional years that have since elapsed has more than verified our statements. The increase of population in Great Britain from 1800 down to 1830, has been at the rate of about 15 per cent each ten years; or of 1 1-2 per cent per annum. A rate of this sort is not easily changed, and there is no reason to think that it has been sensibly affected since 1830. Now, 1 1-2 per cent on the population of 16,539,000 (population of Great Britain at last census,) gives an annual increase of no less than 248,000 individuals; so that it may be concluded, that there are at present (January, 1836) about 1,200,000 persons in Great Britain more than were in it when the late census was taken; and about 500,000 more than when the Committee of 1833 framed their Report. And yet very little foreign corn was imported in 1832, whilst in 1833, 1834, and 1835, the ports were all but hermetically sealed to the foreigner. It is of importance, too, to observe, that, notwithstanding the sinister auguries of the Committee, and notwithstanding the greatly increased demand for corn, evinced by the rapid increase of population, the supply has been increased in a still greater ratio. This is evident from the decline of prices, which have sunk from 58s. 8d. in 1832, to less than 38s. at present!

This wonderful result, so different from was expected, is partially, no doubt, a consequence of the unusually productive harvests of the last two years; but it is ascribable, in a far greater degree, to the influence of improvements. With the exception of some counties in the south and west of England, which continue in a comparatively stationary state, improvements have been every where carried on with extraordinary spirit. Among the principal of these may be specified improved drainage, a better rotation of crops, the general use of bone manure, and the opening of new channels of communication by steam-boats and otherwise. Drainage lies at the bottom of almost every amelioration; and it is prosecuted to an extraordinary extent, with surprising success. The practice of furrow draining is now widely diffused over the north and east of England; and it has been introduced, within the last half dozen years, into this part of the country, and is carried on upon a scale that will hardly be believed by those not acquainted with the facts. Landlords and tenants are every where availing themselves of this new discovery. Perhaps, however, Ayrshire, is at present, in this respect at the head of every county in the empire. It has a great deal of wet, clayey soil, suitable for this employment; and so well is its value understood, that many millions of drain tiles are now annually manufactured in the neighborhood of Kilmarnock and other parts of the county, though this supply be still unequal to the demand. The Duke of Portland and some other landlords drain for their tenants on their paying an extra rent of 4s. and 5s. an acre; and this is said to be decidedly under the additional value given by the drainage to the land. The practice is rapidly extending in Lanarkshire, Dumfriesshire, and other Scotch counties, and has already had, and, no doubt, will continue to have, an astonishing influence over their productive capacities.

A better rotation of crops is also every where in the course of being adopted. The high prices of the war tempted the farmers to sow wheat too frequently, and without proper preparation; the fertility of the soil being, in consequence, materially impaired in many districts. This was particularly the case in the Lothians. But this defect in the management is now nearly obviated. Clover and artificial grasses are kept longer down; barley is sometimes substituted for wheat. The fertility of the soil is preserved; and taking even the best of the old improved land, it now produces, at an average, a larger amount of food.

But of all the recent improvements in agriculture, the introduction and general use of bone manure is perhaps the most important. It first began to be employed on a large scale in Yorkshire and Lincolnshire; and, in the latter particularly, its influence has been all but miraculous. Most part of the Wolds of Lincolnshire, an extensive tract of country, stretching from Spilsbury north to Barton on the Humber, consisted, when Arthur Young wrote his survey of the county, of mere wastes, occupied by rabbit warrens. Could he now revisit the Wolds, he would hardly recognize a single feature of their former state. The warrens have disappeared, and in their stead we find some of the finest farms and best managed land in England. This signal improvement, though it did not begin, has been carried to its present pitch of perfection by the use of bone manure. We are informed, in the late elaborate report of the Doncaster Agricultural Association on this manure, that before bones were generally used with turnip-seed, many thousand acres (in the Wolds of Lincolnshire and Yorkshire) were annually sown for that crop without any manure whatever, from the impossibility of getting fold manure for more than a third or a fourth part of their fallows. The turnips upon such unmanured land were consequently very indifferent; and the benefit of such feeding upon their tops, for bottoms they seldom had any, was very trifling. Since the use of bones has, however, become general, the turnip crop, has been in many instances *ten-fold*, and in few, less than *four* or *five-fold* its former bulk. All the succeeding crops of grain and seeds have been amazingly increased; and, upon the four or five-shift system, there is no doubt, the land will go on progressively improving, requiring a less quantity of bones annually, from its increased fertility and power.

This, be it observed, is the testimony of practical men, well acquainted with all the circumstances; and it is decisive as to the extraordinary value and importance of bone manure on light chalky soils. A single farmer in the Wolds of Lincolnshire (Mr. Dawson of Withcall, near Louth,) has generally about 600 acres of turnip, dressed almost entirely with bone manure They are excellent, and furnish a vast supply of food for cattle, and of manure for other land, besides preparing and fitting the ground for bearing the most luxuriant crops of wheat and barley.*

In Scotland, the introduction of bone manure is more recent; but here, too, it has already had a suprising influence. It is every where in fact—in the Lothians and Berwickshire, as well as in the most backward districts—working wonders. From the comparative facility with which it is conveyed to rugged hilly tracts, it enables estates to be improved and fertilized that must otherwise have remained in a state of nature. Besides large quantities of bone dust imported, bone mills are now constructed in the vicinity of every considerable town in Scotland, for the preparation of this most valuable manure.

We have previously noticed the influence of new roads, and other improved means of communication, on the progress of improvement, during the first thirty-five years of the reign of George III. But during the last few years, there has been, in this respect, a still more astonishing change. The application of steam to navigation, has given to a voyage by sea the expedition, and almost the certainty, of mail-coach travelling, at comparatily little cost; and steam-packets for the conveyance of bulky and heavy articles, as well as passengers, are now established all along the coast. The markets of London and Liverpool are thus brought, as it were, almost to the door of the occupier in the remotest districts. Formerly, it was the practice for farmers in Scotland to send up cattle and sheep half fed to the Norfolk fairs; where they were bought by graziers to fatten for the metropolis. But this practice is already much fallen off, and will, at no distant period, be known only by report. Cattle and sheep are now fattened at home: and are sent up from the eastern ports, either alive or slaughtered, to London by steam. The advantages of this are great. The crops of turnips acquire a new and greatly increased value, and their culture is, in consequence, much extended. Nor does the cost of conveying the full-fed animal to its destination amount to a fourth part of what it formerly took to convey the half-fed animal to Norfolk. All the ports of any consequence on the western coast of Scotland are now almost weekly visited by steamers from Liverpool; and such has been the influence of this newly opened intercourse, that we are well assured that, in the extensive tract of country, stretching from Greenock round by the Mull of Galloway to the Cumberland border, to the distance of ten or fifteen miles inland, the turnip culture has been increased in a ten-fold proportion since 1820. This stimulus will, it is probable, be still farther augmented by the formation of rail-roads. It is clear indeed, that contiguity to market has already become of comparatively little importance. At no distant period, means will be afforded for bringing the most remote and secluded districts fairly into competition with those that are most favorably situated. The productive energies of both will, in consequence, be more fully developed; nor is it easy to conjecture what the result may be.

It is notwithstanding, supposed by several, that if prices should decline still further, or even if they continue at their present level, production will be seriously checked. But the previous statements show that there is really nothing to warrant any such concluson. Hitherto, despite the heavy fall of prices, improvements have been prosecuted on the most stupendous scale; and the fair presumption is, speaking generally, that they will continue to be prosecuted even though prices should fall still lower. It is difficult to estimate the influence that necessity and a desire to preserve one's place in society have in making men inventive and economical; or to specify the point at which production will be contracted by a lowering of prices. In 1823 and 1824, when upland or bowed Georgia cotton brought in Liverpool from 6 1-4d. to 10 1-2d. per lb., many of the most intelligent persons, both in this country and in America, were firmly of opinion that the price would not indemnify the planter, and that the production of cotton would certainly decline. This notion was, in fact, at the bottom of the great cotton speculation in 1825. Experience has since shown the utter groundlessness of the opinion; or though the price of cotton has not risen, except now and then, for a short time, during the interval, the exports of cotton wool from the United States, which, in 1824, amounted to 142,369,663 lbs., had increased in 1834 to 384,717,907 lbs., exclusive of a greatly increased quantity used at home.

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* Kennedy and Grainger on the Tenancy of Land, vol. i. p. 269.

Of course we do not mean to say that the prices may not fall so low as to check improvement; but certainly there is no evidence to show that they have already touched that point, or even come very near it. It should also be recollected, that, notwithstanding all that has been done, there is still a vast field for agricultural improvement in Britain. We showed in a former article (No. 120, Art. 6,) that it was the opinion of practical men of the highest respectability, and intimately acquainted with the state of agriculture, that the raw produce of the island might be well nigh doubled without any greater proportional expense being incurred in its production. And any one who has ever travelled through the country, or has compared the state of the Lothians, Northumberland, Lincoln, Norfolk, and other well-farmed counties, with very extensive districts in the south and west of England, and with Wales, will be satisfied that the above is any thing but an exaggerated statement. It is singular indeed how very backward many districts are, as compared with others. In numerous counties, four and five horses and two men are still employed to do that which is better done in others by two horses and one man; and in many parts the drill husbandry can hardly be said to be introduced. This shows that we are possessed of vast capacities not yet brought into activity, and that the career of improvement may be continued for an almost indefinite period.

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SLAVERY IN VIRGINIA.

Extract from *Slavery in the United States*—by J. K. PAULDING: being a letter to the author from a farmer of lower Virginia.

Dear Sir—As regards the first query, which relates to "the rights and duties of the slave," I do not know how extensive a view of this branch of the subject is contemplated. In its simplest aspect, as understood and acted on in Virginia, I should say that the slave is entitled to an abundance of good plain food; to coarse but comfortable apparel; to a warm but humble dwelling; to protection when well, and to succor when sick; and, in return, that it is his duty to render to his master all the service he can, consistently with perfect health, and to behave submissively and honestly. Other remarks suggest themselves, but they will be more appropriately introduced under different heads.

2d. "The domestic relations of master and slave." These relations are much misunderstood by many persons to the north, who regard the terms as synonymous with oppressor and oppressed. Nothing can be farther from the fact. The condition of the negroes in this state has been greatly ameliorated. The proprietors were formerly fewer and richer than at present. Distant quarters were often kept up to support the aristocratic mansion. They were rarely visited by their owners; and heartless overseers, frequently changed, were employed to manage them for a share of the crop. These men scourged the land, and sometimes the slaves. Their tenure was but for a year, and of course they made the most of their brief authority. Owing to the influence of our institutions, property has become subdivided, and most persons live on, or near their estates. There are exceptions, to be sure, and particularly among wealthy gentlemen in the towns; but these last are almost all enlightened and humane, and alike liberal to the soil, and to the slave who cultivates it. I could point out some noble instances of patriotic and spirited improvement among them. But to return to the resident proprietors: most of them have been raised on the estates; from the older negroes they have received in infancy numberless acts of kindness; the younger ones have not unfrequently been their playmates, (not the most suitable, I admit,) and much goodwill is thus generated on both sides. In addition to this, most men feel attached to their property; and this attachment is stronger in the case of persons than of things. I know it and feel it. It is true, there are harsh masters; but there are also bad husbands and bad fathers. They are all exceptions to the rule, not the rule itself. Shall we therefore condemn in the gross those relations, and the rights and authority they imply, from their occasional abuse? I could mention many instances of strong attachment on the part of the slave, but will only adduce one or two, of which I have been the object. It became a question whether a faithful servant, bred up with me from boyhood, should give up his master, or his wife and children, to whom he was affectionately attached, and most attentive and kind. The trial was a severe one, but he determined to break those tender ties and remain with me. I left it entirely to his discretion, though I would not, from considerations of interest, have taken for him quadruple the price I should probably have obtained. Fortunately, in the sequel, I was enabled to purchase his family, with the exception of a daughter, happily situated; and nothing but death shall henceforth part them. Were it put to the test, I am convinced that many masters would receive this striking proof of devotion. A gentleman but a day or two since informed me of a similar and even stronger case, afforded by one of the slaves. As the reward of assiduous and delicate attention to a venerated parent, in her last illness, I proposed to purchase and liberate a healthy and intelligent woman, about thirty years of age, the best nurse, and, in all respects, one of the best servants in the state, of which I was only part owner; but she declined to leave the family, and has been since rather better than free. I shall be excused for stating a ludicrous case I heard of some time ago: A favorite and indulged servant requested his master to sell him to another gentleman. His master refused to do so, but told him he was at perfect liberty to go to the north, if he were not already free enough. After a while he repeated the request; and, on being urged to give an explanation of his singular conduct, told his master that he considered himself consumptive, and would soon die; and he thought Mr. B—— was better able to bear the loss than his master. He was sent to a medicinal spring, and recovered his health, if indeed he had ever lost it, of which his master had been unapprised. It may not be amiss to describe my deportment towards my servants, whom I endeavor to render happy while I make them profitable. I never turn a deaf ear, but listen patently to their communications. I chat familliarly with those who have passed service, or have not begun to render it. With the others I observe a more prudent reserve, but I encourage all to approach me without awe. I hardly ever go to town without having commissions to execute for some of them; and think they prefer to employ me, from a belief that, if their money should not quite hold out, I would add a little to it; which I not unfrequently do, in order to get a better article. The relation between myself and my slaves is decidedly friendly. I keep up pretty exact discipline, mingled with kindness; and hardly ever lose property by thievish, or labor by runaway slaves. I never lock the outer doors of my house. It is done, but done by the servants; and I rarely bestow a thought on the matter. I leave home periodically for two months, and commit the dwelling-house, plate, and other valuables to the servants, without even an enumeration of the articles.

3d. "The duration of the labor of the slave." The day is usually considered long enough. Employment at night is not exacted by me, except to shell corn once a week for their own consumption, and on a few other extraordinary occasions. *The people*, as we generally call them, are required to leave their houses at daybreak, and to work until dark, with the intermission of half an hour to an hour at breakfast, and one to two hours at dinner, according to the season and sort of work. In this respect I suppose our negroes will bear a favorable comparison with any laborers whatever.

4th. "The liberty usually allowed the slave; his holydays and amusements; and the way in which they usually spend their evenings and holydays." They are prohibited from going off the estate without first obtaining leave; though they often transgress, and with impunity; except in flagrant cases. Those who have wives on other plantations, visit them on certain specified nights, and have an allowance of time for going and returning, proportioned to the distance. My negroes are permitted, and indeed encouraged, to raise as many ducks and chickens as they can; to cultivate vegetables for their own use, and a patch of corn for sale: to exercise their trades when they possess one, which many do; to catch muskrats and other animals for the fur or the flesh; to raise bees, and, in fine, to earn an honest penny in any way which chance or their own ingenuity may offer. The modes specified are however, those most commonly resorted to, and enable provident servants to make from five to thirty dollars a piece. The corn is of a different sort from that which I cultivate, and is all bought by me. A great many fowls are raised: I have this year known ten dollars worth sold by one man at one time. One of the chief sources of profit is the fur of the muskrat; for the purpose of catching which the marshes on the estate have been parcelled out and appropriated from time immemorial, and are held by a tenure little short of fee-simple. The negroes are indebted to Nat Turner* and Tappan for a curtailment of some of their privileges. As a sincere friend to the blacks, I much regretted the reckless interference of these persons, on account of the restrictions it has become, or been thought necessary, to impose. Since the exploit of the former hero, they have been forbidden to preach except to their fellow-slaves, the property of the same owner; to have public funerals, unless a white person officiates; or to be taught to read and write. Their funerals formerly gave them great satisfaction, and it was customary here to furnish the relations of the deceased with bacon, spirit, flour, sugar, and butter, with which a grand entertainment, in their way, was got up. We were once much amused by a hearty fellow requesting his mistress to let him have his funeral during his lifetime, when it would do him some good. The waggish request was granted; and, I venture to say, there never was a funeral, the subject of which enjoyed it so much. When permitted, some of our negroes preached with great fluency. I was present a few years since when an Episcopal minister addressed the people, by appointment. On the conclusion of an excellent sermon, a negro preacher rose and thanked the gentleman kindly for his discourse, but frankly told him the congregation "did not understand his *lingo*." He then proceeded himself, with great vehemence and volubility, coining words where they had not been made to his hand, or rather his tongue, and impressing his hearers, doubtless, with a decided opinion of his superiority over his white co-laborer in the field of grace. My brother and I, who own contiguous estates, have lately erected a chapel on the line between them, and have employed an acceptable minister of the Baptist persuasion, to which the negroes almost exclusively belong, to afford them religious instruction. Except as a preparatory step to emancipation, I consider it exceedingly impolitic, even as regards the slaves themselves, to permit them to read and write: "Where ignorance is bliss," 'tis folly to be wise." And it is certainly impolitic as regards their masters, on the principle that "knowledge is power." My servants have not as long holydays as those of most other persons. I allow three days at Christmas, and a day at each of three other periods, besids a little time to work their patches, or, if very busy, I sometime prefer to work them myself. Most of the ancient pastimes have been lost in this neighborhood, and religion, mock or real, has succeeded them. The banjo, their national instrument, is known but in name, or in a few of the tunes which have survived. Some of the younger negroes sing and dance, but the evenings and holydays are usually occupied in working, in visiting, and in praying and singing hymns. The primitive customs and sports are, I believe, better preserved farther south, where slaves were brought from Africa long after they ceased to come here.

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* The leader of the insurrection in Lower Virginia, in which upwards of a hundred white persons, principally women and children, were massacred in cold blood.

6th. "The provision usually made for their food and clothing; for those who are too young or too old to labor." My men receive twelve quarts of Indian meal (the abundant and universal allowance in this state,) 7 salted herrings, and 2 lbs. smoked bacon, or 3 lbs. of pork a week; the other hands proportionally less. But, generally speaking, their food is issued daily, with the exception of meal, and consists of fish or bacon for breakfast, and meat, fresh or salted, with vegetables, whenever we can provide them, for dinner; or, for a month or two in the spring, fresh fish cooked with a little bacon. This mode is rather more expensive to me than that of weekly rations, but more comfortable to servants. Superannuated or invalid slaves draw ther provisions regularly once a week; and the moment a child ceases to be nourished by its mother, it receives 8 quarts of meal (more than it can consume,) and ½ lb. of lard. Besides the food furnished by me, nearly all the servants are able to make some addition from their private stores; and there is, among the adults, hardly an instance of one so improvident as not to do it. He must be an unthrifty fellow indeed who cannot realize the wish of the famous Henry IVth in regard to the French peasantry, and enjoy his fowl on Sunday. I always keep on hand, for the use of the negroes, sugar, molasses, &c., which, though not regularly issued, are applied for on the slightest pretexts, and frequently no pretext at all, and are never refused except in cases of misconduct. In regard to clothing: the men and boys receive a winter coat and trowsers of strong cloth, 3 shirts, a stout pair of shoes and socks, and a pair of summer pantaloons, every year; a hat about every second year, and a great-coat and blanket every third year. Instead of great-coats and hats, the women have large capes to protect the bust in bad weather, and hankerchiefs for the head. The articles furnished are good and serviceable; and, with their own acquisitions, make their appearance decent and respectable. On Sunday they are even fine. The aged and invalid are clad as regularly as the rest, but less substantially. Mothers receive a little raw cotton, in proportion to the number of children, with the privilege of having the yarn, when spun, woven at my expense. I provide them with blankets. Orphans are put with careful women, and treated with tenderness. I am attached to the little slaves, and encourage familiarity among them. Sometimes, when I ride near the quarters, they come running after me with the most whimsical requests, and are rendered happy by the distribution of some little donation. The clothing described is that which is given to the crop hands. Home servants, a numerous class in Virginia, are of course clad in a different and very superior manner. I neglected to mention, in the proper place, that there are on each of my plantations a kitchen, an oven, and one or more cooks; and that each hand is furnished with a tin bucket for his food, which is carried into the field by little negroes, who also supply the laborers with water.

7. "Their treatment when sick." My negroes go or are carried, as soon as they are attacked, to a spacious and well-ventilated hospital, near the mansion-house. They are there received by an attentive nurse, who has an assortment of medicine, additional bed-clothing, and the command of as much light food as she may require, either from the table or the store-room of the proprietor. Wine, sago, rice, and other little comforts appertaining to such an establishment, are always kept on hand. The condition of the sick is much better than that of the poor whites, or free colored people, in the neighborhood.

8. "Their rewards and punishments.' I occasionally bestow little gratuities for good conduct, and particularly after harvest; and hardly ever refuse a favor asked by those who faithfully perform their duty. Vicious and idle servants are punished with stripes, moderately inflicted; to which in the case of theft, is added privation of meat, a severe punishment to those who are never suffered to be without it on any other account. From my limited observation, I think that servants to the north work much harder than our slaves. I was educatad at a college in one of the free states, and, on my return to Virginia, was struck with the contrast. I was astonished at the number of idle domestics, and actually worried my mother, much to my contrition since, to reduce the establishment. I say to my contrition, because, after eighteen years residence in the good Old Dominion, I find myself surrounded by a troop of servants about as numerous as that against which I formerly so loudly exclaimed. While on this subject it may not be amiss to state a case of manumission, which occurred about three years since. My nearest neighbor, a man of immense wealth, owned a favorite servant, a fine fellow, with polished manners and excellent disposition, who reads and writes, and is thoroughly versed in the duties of a butler and housekeeper, in the performance of which he was trusted without limit. This man was, on the death of his master, emancipated, with a legacy of $6,000, besides about $2,000 more which he had been permitted to accumulate, and had deposited with his master, who had given him credit for it. The use that this man, apparently so well qualiged for freedom, and who has had an opportunity of travelling and of judging for himself, makes of his money and his time, is somewhat remarkable. In consequence of his exemplary conduct, he has been permitted to reside in the state, and for very moderate wages occupies the same situation he did in the old establishment; and will probably continue to occupy it as long as he lives. He has no children of his own, but has put a little girl, a relation of his, to school. Except in this instance, and in the purchase of a few plain articles of furniture, his freedom and his money seem not much to have benefited him. A servant of mine, who is intimate with him, thinks he is not as happy as he was before his liberation. Several other servants were freed at the same time, with smaller legacies, but I do not know what has become of them.

I do not regard negro slavery, however mitigated, as a Utopian system, and have not intended so to delineate it. But it exists, and the difficulty of removing it is felt and acknowledged by all save the fanatics, who like "fools, rush in where angels dare not tread." It is pleasing to know that its burdens are not too heavy to be borne. That the treatment of slaves in this state is humane, and even indulgent, may be inferred from the fact of their rapid increase, and great longevity. I believe that, constituted as they are, morally and physically, they are as happy as any peasantry in the world; and I venture to affirm, as the result of my reading and inquiry, that in no country are the laborers so liberally and invariably supplied with bread and meat as are the negro slaves of the United States. However great the dearth of provisions, famine never reaches them.

P. S.—It might have been stated above, that on this estate there are about 160 blacks. With the exception of infants, there has been in eighteen months but one death that I remember, that of a man fully 65 years of age. The bill for medical attendance from the second day of last November, comprising upwards of a year, is less than forty dollars.

THE "JOHN FRANCIS" LETTER.

We have learned that the letter signed "John Francis" from Prince Edward county, which was published in No. 1, was a specimen of what is called in polite language, *hoaxing*—but what some plain speaking men might deem more correctly designated as a lie supported by forgery. The manner in which the deception was practiced, shows that the unknown author possesses a considerable share of the *particular kind of talent* that is necessary for success in sustaining fraud, and making falsehood appear as truth. If he is still young enough to cultivate, and give the proper direction to this talent, we doubt not that he will yet cut a distinguished figure *at the bar*—but whether *before* or *behind it*, we venture not to predict.

From the Arcana of Science and Art, for 1836.

SPONTANEOUS PLANTS.

Few things are more extraordinary than the unusual appearance and developement of certain plants in certain circumstances. Thus after the great fire of London in 1666, the entire surface of the destroyed city was covered with such a vast profusion of a species of a cruciferous plant, the *Sisymbrium irio* of Linnæus, that it was calculated that the whole of the rest of Europe could not contain so many plants of it. It is also known that if a spring of salt water makes its appearance in a spot, even a great distance from the sea, the neighborhood is soon covered with plants peculiar to a maritime locality, which plants, previous to this occurrence, were entire strangers to the country. Again, when a lake happens to dry up, the surface, is immediately usurped by a vegetation which is entirely peculiar, and quite different from that which flourished on its former banks. When certain marshes of Zealand were drained, the *Carex cyperoides* was observed in abundance, and it is known this is not at all a Danish plant, but peculiar to the north of Germany. In a work upon the Useful Mosses by M. de Brebisson, which has been announced for some time, this botanist states that a pond in the neighborhood of Falain having been rendered dry during many weeks in the height of summer, the mud, in drying was immediately and entirely covered, to the extent of many square yards, by a minute, compact, green turf, formed of an imperceptible moss, the *Phaseum axillare*, the stalks of which were so close to each other, that upon a square inch of this new soil, might be counted more than five thousand individuals of this minute plant, which had never previously been observed in the country.

TO MAKE STARCH.

To the Editor of the Farmers' Register.

Through the medium of your valuable paper, I wish to communicate to the household economist, an article of knowledge recently obtained, relative to *starch-making*.

The common tedious process of soaking and rotting the wheat, is subject to many inconveniences, such as the temperature of the weather, the labor of heating and rubbing the grain, and not *least*, the very offensive and unwholesome odor arising from the fermentation; which last, is entirely obviated by the method I would propose for adoption.

Have the wheat first ground in a common corn mill, then sift the bran from the flour, and put them both into separate tubs of water. After the expiration of twenty-four hours, change the water to the bran, and rub it very well, for the superfine starch is obtained chiefly from the particles attached to the bran; then strain the water off through a fine hair sieve into the vessel which contains the flour. This also should be strained through fine muslin, but a small blanket washed nicely is most to be depended on. The water should be changed twice a day, and the vessel set in the sun. This should be continued until there is no yellow appearance in the water; then the starch is perfectly bleached; and when it is well settled, drain off the top, which is of inferior quality, and tie it in a bag to dry. The pure and superfine starch will adhere closely to the bottom of the tub: break it up and put it in dishes to dry. The chief economy of this plan is, that any spoilt flour, unfit for bread, can be converted into the useful article of *starch*.

It must by no means be permitted to ferment, for this would prevent the separation of the two qualities, and can easily be prevented by changing the water as above directed. This process will yield a greater proportion of starch, and of better quality, than can be obtained from the soaked wheat. "——."

ON THE MANAGEMENT OF THE TOBACCO CROP.

[Continued from page 3, vol. IV.]

To the Editor of the Farmers' Register.

30th May, 1836.

After an absence of a month from home, I find in your May No. a request, that, in addition to my former remarks on the preparation and management of tobacco plant beds, I will "furnish all the details of the usual, most laborious, and costly operation of burning patches for tobacco plants."

After raking off the leaves, the whole length of one side of the patch, skids of about 4 inches diameter are laid, and 3 or 4 feet apart. Wood is then laid across about 4 or 5 feet broad, and raised nearly, or quite, three feet high, intermixed with dry wood, and battered to a narrow space at the top, and the leaves thrown on to start the fire, which is kindled at short intervals from one end to the other. When it is burnt down sufficiently low, long green poles (say about 10 feet) with a strong hook at the end, are applied by two men to each log, and it is hauled back another breadth of the fire, or nearly so, hauling back the leaves, and renewing the skids as occasion requires, and piling the wood on, as at first, but dispensing with the dry wood, if you choose, since any wood will burn after the heat becomes strong. This operation goes on till the whole patch is burnt over. When this strong heat is created, it is unwise, if it can be prevented, to let the fire go out till the work is finished; consequently, it is begun many hours before day, and perhaps, kept up till after night comes on again. This is done at the proper season for sowing the seed, say January, February, or March, if the ground is not dry enough before. It is then dug with hoes, taking care to draw them out without turning in the surface of the earth. Work it over and over till it is quite fine. Rake it nicely with hand rakes, and take off the roots which are gathered. Mark it with a stick about four feet between the marks. Something less than a level table spoonful of good clean seed is sufficient for a hundred square yards. Measure half the seed, and mix them well in a liberal quantity of ashes, (say about a quart to the spoonful.) Walk between the marks, sifting the seed through the fingers, from mark to mark, going over the whole patch. Then go over it again upon the marks, reaching half way to the neighboring mark on each side. In these two operations, but half the number of seed should be sown. Then mark across, mix the other half the seed, and go over in like manner. This particularity is not observed by all. The practice, for the most part, is to go over once each way. But when it is recollected that every plant which does not attain a proper size is lost, and, consequently, every part that is sown too thick is thrown away, it will readily occur to the tobacco maker that this little additional pains is well bestowed. It is then trodden close, each hand going sideways, and one governed by the track of another, till the whole is gone over—then cover nicely with naked brush. This process of hauling the fire is very distressing, particularly when the wind shifts, which sometimes makes it necessary to move the fire to another side of the patch. For this reason, as well as because the heat all operates together, I now generally pack it as mentioned in my former number, and burn for immediate sowing. But in this case, it is absolutely necessary to procure a great deal of seasoned wood and brush, to mix with the green, otherwise it will not burn out clear, and of course the land will not be well burnt. It requires more too than upon the plan mentioned in my former number: because, in that case the fire must be put to it when it is quite dry, and of course before the winter begins.

This description is given, Mr. Editor, for those who are novices in the business. And I will here take occasion to repeat to my brother planters, that what I have said, and may say, is not intended for those who know as much or more about it than I do. It was my intention to give some hints about the manner of manuring, hilling, &c., but they will be too late for the present crop. Nevertheless, I will briefly remark, that care should be taken to manure very regularly, so that the crop may be uniform. For the same reason, and others, it is important always to make the hills when the ground is in a moist condition, but not wet, (for no operation should be performed when the soil is at all too wet—it is much worse than hard cropping,) and a hill should never be cut off till there is a plant ready to put into it immediately. Because, if it is cut off before the rain falls, upon which it is planted, a crust is formed, the rays of light and heat are reflected, and the leaves of the plant parched; whereas, the friable surface of the hill freshly cut off, imbibes more freely the atmospheric influence, which communicates more readily with the moisture below, so that you will often find it quite moist in the morning, when that which has a crust on it is dry. If rain falls on it after it is planted, be it so; it is better than before. When the hills are put up with a "season" in them, we cut them off and plant without rain, as fast as the plants are large enough, taking care to draw them in the morning when the dew is on, and keeping them covered with wet bushes, till they are dropped and planted, without allowing them to *fall* (or wither.) The operation of the sun upon the top of the leaf after it is planted, is less injurious than may be imagined by those inexperienced. I last year planted an entire crop on a large plantation, without a "season," and it stood unusually well. Here, let it be remarked, that a plant should not be drawn, if it can be avoided, till it is large enough, and has a good root.

It may sometimes happen, that the hills dry through, so as to make it necessary to cut them off in order to have them made wet by a rain. But this is an evil that ought to be avoided if it can. This happens when the plants are late. For this cause, I have been compelled to put up the hills later than I would wish. And when there is much to be done, I have found it necessary to prepare the land well, lay it in beds with the plough, check it at the proper distance, and leave it in this rough state till it rains, so that the hands will round up 4000 each, per day, before it gets dry, and thereby preserve the season in the hill. Indeed I have, in this way, when the plants had attained a proper size, levelled the surface, clapped it with the hoe, as usual, and planted without hilling. Let it be observed, that the first plant that is put in, stands a better chance to live, than any that is afterwards put in by replanting. And it is all-important to have an even crop, because in all the after operations of topping, suckering and cutting, more business is done at each operation, and of course a larger crop can be managed with the same number of hands.

Referring to the business of burning patches, I have no doubt, as fuel becomes more scarce, other means will be adopted that will effect a still greater saving, particularly by resorting to standing patches, which, as they become older, require less burning. But it will be found that these must be surrounded by woods, if possible. For the insect tribe which is multiplying upon us at such a prodigious rate, commit much greater ravages in places exposed to the winds, and the grass and weeds in which they take shelter, than in the woods. This growing evil is one cause that drives us to the culture of tobacco for our profits, which would otherwise be derived in much greater measure from wheat. This crop is now the most uncertain of any we make, which was once our principal staple in the country I inhabit.

I should have mentioned above, that every plant should be primed and topped as soon as it is large enough. It is a practice with some planters not to prime at all; but I do not approve of it. This operation requires more judgment than is generally believed; because, it depends upon the strength of the land and the growth of the plant, how high it should be primed, and how many leaves it should be topped to, so as to make the most of it. The best general rule I can advise is, to prime up to the largest and most promising leaf, and top to eight leaves. This will generally be found about six to eight inches above the top of the hill, according to the strength of the land; in poor land, not so much. Where the land is rich, it will bear as many as ten leaves—very rarely more. The top leaf, when it comes to maturity, ought to be as rich as any on the plant: if it is not, it is a proof that it has not been well managed, or that the season has not suited it. Deep cultivation is essential during its growth; but when it is near to maturity, it is sometimes necessary to give it superficial working, as well because it is too large to plough, as because it is wrong to cut the roots when it is about to make itself, and come to the knife. But I sometimes plough when some of the leaves are broken off by the horse, under the belief that more is gained than lost. In this case a stretcher should be used to draw by, instead of the bar.

I may perhaps, in due time, trouble you with some observations upon the process of curing, which may throw some light upon this very important branch of its management, although I must assure you, it is my unfeigned belief, that many modern planters understand it better than I do.

Permit me now to return my thanks to the editor for the handsome compliment bestowed upon me in his last number. I must, however, express my very sincere regret, that the subject upon which I have treated is so little calculated to advance the permanent interest of our exhausted country. It would be far more gratifying to me if I could give encouragement to the business of farming. Let it not be understood by my brother planters that I am altogether inattentive to the improvement of my estate. I did, I must confess, exhaust the tract of land I began with; but I am now comforted with the belief, that each year finds it a little more fertile than it was at the beginning of the last. The profit of the tobacco crop enables me to purchase clover seed and plaster, which I make considerable use of. And a good portion of the fall and winter is employed in collecting leaves, corn stalks, &c., from which I raise as large a mass of manure as possible, till the time arrives for making the necessary preparation for the summer's work. Yet it must be confessed that the tobacco crop costs too much labor to leave as much time as ought to be employed in improvement. The amount of tobacco land which is rich enough without dung, and other circumstances which the judicious cultivator must decide upon, must determine the question how far he is justified in consulting immediate, rather than ultimate profit.

A PLANTER.

COLD WEATHER—FLORIDA SOIL AND "LIMESTONE"—SEA ORE AND OTHER MANURE, &c.

To the Editor of the Farmers' Register.

Old Point Comfort,
June, 2d, 1836.

I am sitting by a cheerful Lehigh coal fire, and do not know how I can better employ my time, than by throwing together, for your journal, a few promiscuous facts and reflections connected with agriculture.

The fact already announced of the comfort of a good fire in June, is, in itself, worthy of record, and forces us to the conclusion, that our climate is undergoing a decided and progressive change. What effect this is to have upon our general agriculture, time alone will develope. Last winter, nearly every orange tree in Florida was destroyed. I saw trees, known to be 40 years old, killed to the ground, and could but admire the philosophic confidence of an old gentleman on the St. John's, nearly 80 years of age, whose grove I visited, and who, when I wished to sympathize with him on his loss, coolly observed, "it can't be helped—if I have good luck, in ten or twelve years, it will be as productive as ever."

I was apprehensive I had noticed a fact in Florida, which might tend, in some degree, to weaken the established theory of the operation of calcareous manures, on soils producing acid plants; in which class the pine has been included.

An attempt had been made, 3 or 4 years ago, to sink a well in the pine woods near Fort King. At the depth of 6 or 8 feet, a stratum of very rich carbonate of lime was found: it was thrown out, and formed an embankment around the mouth of the well, from 1 to 3 feet thick. On this embankment, I discovered a luxuriant growth of young pines, some just emerging from the lime. The natural conclusion was, that the pines received their nutriment from the lime; but I was not disposed to concede the point without further investigation. I returned to the spot the next day, and after a careful examination, discovered that the roots, in every instance. were deeply imbedded in the sand below, and not a solitary fibre was found penetrating the lime.

On another occasion I visited a spot, also in the pine woods, where the lime for the use of the Fort had been burned for two or three successive years. The refuse of the kilns was scattered over a space of about thirty yards square. The young pines were springing plentifully all around the area; but within it, there was not one to be seen. The only growth on it was the worm seed, (*Artemesia Santonicum,*) and this, though most luxuriant, was found no where else in the neighborhood. May not this fact be of importance in directing the application of lime as a manure? for it may turn out, on investigation, that this plant will not thrive on a soil devoid of calcareous matter.

The country about Fort King is called a limestone country. The pine lands, which constitute four-fifths of this region, to all appearances, are very little more than barren sands, producing scarcely any undergrowth but rank grass, and interspersed, in every direction, with what has been called rotten limestone, containing the impression of various marine shells. Pursuing still the inquiry how such immense forests of pine should grow in a soil evidently calcareous, I concluded to analyze it, and to my surprise, found it did not contain one particle of carbonate of lime. This appeared the more extraordinary, as the rotten limestone was all around me in large masses, as well as disintegrated. I then undertook to ascertain what proportion of the carbonate was contained in this rotten limestone; and to my still greater surprise, could not detect the existence of the minutest quantity. I made the analysis with the best muriatic and sulphuric acids; besides, submitting many specimens to an intense heat. The fact is, it was nothing more nor less than an agglutination of silicious and aluminous matter, forming a species of sand stone, and serving as a matrix in which the shells had been deposited. So perfect were their impressions, that no one, for a moment, could have doubted their actual presence; but all traces of lime had entirely disappeared. Whether it had combined with humic acid, or formed some other compound, I cannot undertake to decide.

There is one singular fact, however, in connection with these Florida lands; to all appearances, they are as barren as the lands from the sea shore; yet, for one or two successive years, they yield tolerable crops of corn or cotton.

We have been made fully acquainted, through the Register, with the value of sea ore as a manure. I can bear testimony to all that has been said in its favor. I have employed it to advantage on corn, but with much more success on wheat and oats. My attention was first directed to it three years ago, by finding on the beach bordering my farm, at high-water mark, a luxuriant bunch of wheat, in full head, growing out of a mass of sea ore: there was no soil within ten yards of it. In the spring of 1834, I covered a small part intended for oats and ploughed it in: the oats were harrowed in. They turned out decidedly better than the remainder of the field. There was one particular spot, where the growth was so rank as to be a matter of observation to every one passing. On examining this spot, I found them growing out of a pile of the sea ore which had apparently been thrown up in the operation of harrowing.

About the same time I top-dressed a small strip of wheat with sea ore. The good effects were very soon discernable, and the place could be pointed out, any time before harvest, as far as the wheat could be fairly seen.

I think the best way of applying the sea ore, is fresh from the beach. Its fertilizing property seems to depend chiefly on the saline and gelatinous matter with which it is incorporated, and these are materially changed by its decomposition in the farm yard.

The objection to its use in this neighborhood is, that it makes the wire grass grow. This I conceive to be its highest eulogium; for what will make grass grow, will assuredly make wheat and corn grow.

A great deal has been written, but not enough yet, on the subject of making manure. No part of our country abounds with greater facilities for this purpose, than the tide water region of our State. We have only to say to our cartman, "bring a load of manure," and it is brought; yet how few will ever give this simple order. The excuse is, the hands cannot be spared from the fields, or they are mauling rails, or catching oysters. Now the remedy is a simple one: make your fields smaller, and you will have more leisure for your hands in summer, and fewer rails to maul in winter; or, if you are determined to be an oysterman, then give up farming altogether.

But, says one, "my fields are already so small, I can hardly make corn enough to live on." Now this brings us to the gist of the matter. Make manure, and my life upon it, you will make more corn from one acre, than you did from two before. It can be demonstrated, as plainly as that two and two make four, that the amount of labor bestowed on a twenty acre field to produce sixty barrels of corn, if applied to making manure and manuring ten acres, will, on these ten acres, produce more the first year than the twenty acres did. Now, carry out this principle, and by the time you have manured your remaining shifts, in the same proportion, and to the standard of productiveness attained by the first, you will be enabled to dispense with one half of your original labor, and obtain the same results you did from the whole; because, it is just as easy to plough good land as bad, and a judicious system of cultivation will enable you to keep your land to the point of fertility it has now arrived at, to say nothing of your diminished expenses in team, harness and agricultural implements.

I hear some of my friends say, "Good preaching this, neighbor—but have you practiced what you preach?" I have, and know it to be true. But if you acknowledge the preaching good, it ought to satisfy you, and you should practise it whether I do or not. I have this year manured all my corn land with good stable and farm yard manure. On eleven acres, I spread and ploughed in 400 single cart loads; the remaining sixteen I manured in the hill. These 27 acres received the year before last, a dressing of burned oyster shells at the rate of a hundred bushels to the acre, and were seeded in wheat and clover. I intend, if possible, always to manure every acre I plant in corn. I have never seen any high land too good to be benefited by it.

I am decidedly of opinion, that the best way of covering corn when planted by hand is with the harrow. Besides the advantage of expedition, it gives a good working to the land. But there is still another, paramount to these: it protects the corn from the crows: they do not know where to look for it. Now in the usual way of covering with the hoe or the foot, the hills are distinctly marked; and a crow will march with as much precision from one to another, as a well-drilled soldier. My experience this year has fully satisfied me of this fact. A part of my corn was planted in drills and harrowed; the remainder in squares and covered with a hoe: the first required scarcely any replanting, and I was forced to replant fully one half of the latter. I found a narrow board tied diagonally across the harrow to two of the teeth, a great improvement: it performed the office of a scraper, and greatly facilitated the operation of covering.

I have used for eight years past an ox-cart, which, for its simplicity, convenience and economy, I can safely and confidently recommend. The body or frame consists of two well seasoned oak rails, about three inches thick and six wide, coupled together by four cross bars, as in the ordinary cart, and mortised through the flat side of the rails: the sides, which consist of boards of the desired width, are supported by three moveable stancheons on each side of the cart, confined each by two staples, the lower one driven into and near the bottom edge of the rail, and the other, in form of a clamp let into the top edge and securely nailed or screwed down. These stancheons are so formed, as to give a considerable spread above to the sides of the cart. The sides are kept from slipping backwards and forwards, by *batons* corresponding to the position of the stancheons, and the front and tail-boards slide between batons, nailed on the inner face of the sides, and thus prevent the sides from falling in. The bottom is moveable, and formed of boards batoned together, the batons corresponding with the cross bars of the body, to prevent slipping back or forth. The description, I think, is sufficiently explicit to a general understanding of the plan. Should any of your correspondents wish a more detailed account, I will furnish it with pleasure. I have had one of these carts in constant use for four years, without any repairs, and to all appearance it is as good as ever.

The advantages of this cart, besides its cheapness, is, that you may dispense with that part of it which is not immediately required: for instance, in hauling wood or rails, you take off the sides and bottom, leaving only the stancheons: this is a considerable advantage, for all are aware of the serious injury done to the sides and bottom of a cart by pitching wood into it: and I am sure my oxen have thanked me a thousand times for relieving them of this unnecessary weight; and in hauling straw or hay, you unship the stancheons and in their stead use poles. R. ARCHER.

We owe thanks to the writer for this letter of scraps, each one of which is interesting or useful. As to the supposed change of our climate, we have no faith in it, as either general or progressive. The observations and novel facts as to the non-calcareous nature of what has been universally termed *limestone* of Florida, are to us particularly interesting. We have heretofore been much puzzled by the accounts of pine forests growing on soil evidently and highly calcareous—a state of things which our doctrines as to calcareous manures and soils, would pronounce to be impossible. But not knowing the facts, we could not undertake to deny what was so confidently and generally asserted—and could only, in silence, await their further developement. Our correspondent, if judging merely by the eye, and by generally existing opinions, might well have added his testimony to that of all previous travellers; but by resorting to an easy chemical test, he was enabled to pronounce safely that neither the "limestone soil" or the "limestone rock," was in the slightest degree calcareous. If we could have similar observations and actual tests applied to the *agricultural* parts of all the books of travels that either learned or literary men have written, it would be found that they had been disseminating and establishing much more error than truth. No traveller yet has paid any attention to, even if one has possessed any knowledge of, the chemical composition of soils, and their consequent fitness or unfitness for particular productions, and particular modes of treatment: and for such a one, there are mines of useful discovery and of knowledge yet to open, in scientific and practical agricultural research.

RECENT AND CURIOUS FACTS AND QUESTIONS, RESPECTING PLASTER BEDS IN NEW YORK.

To the Editor of the Farmers' Register.

Geneseo, N. Y., June 3, 1836.

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I refer you to a copy of a communication I have just made to professor Silliman. Can you clear away the fog which you will perceive surrounds us? Is it possible that the simple operation of pulverizing will add ten-fold to the efficacy of your shell-marl?

* * * * * * * *

An additional fact in relation to the fertilizing quality of lime seems to be rendered very probable, if not certain, by some experiments which have been recently made in this town. A Mr. Moore, in digging a well, hit upon a formation of soft or friable limestone combined with fossil shells of great diversity of formation. Specimens were sent in different directions, and there was but one opinion, among those who tested them, that it was a limestone formation. A bed of gypsum is very valuable. Mr. Moore and his neighbors appeared determined to believe that they had discovered a valuable gypsum formation on their farms. They sent waggon loads to plaster mills, and grist mills, and caused, what they pronounced gypsum, to be spread on a great number of fields, during last fall and this spring. The result has been, in every instance, that the clover, wheat and spring crops have been essentially benefited by the application; and Mr. Moore and his neighbors still believe the substance which they are selling as gypsum, surpasses in efficacy either the Wheatland or the Cayuga plaster. That this formation is equally efficacious with the plaster which is generally used in this section of the State, there seems no reason to doubt; and that it is a limestone formation, is beyond the possibility of a doubt.

Is it possible that the mechanical operation of grinding or pulverizing crude or unburnt limestone, renders it equally fertilizing with gypsum? It appears difficult to avoid this inference. Mr. Moore has erected a windmill—is digging and vending what he calls plaster in great quantities; and the farmers, from hundreds of experiments, entertain the most entire confidence in its efficacy.

With a view of obtaining some additional facts on this subject, which, in its present stage, is a little perplexing, a person called on Mr. Moore with a vial of muriatic acid in his pocket. Mr. Moore showed him specimens of Chillenango, Cayuga, Phelpstown and Wheatland plaster—each of these specimens) effervesced on the application of the acid. This fact seems to add to the perplexity of the subject, and would appear to indicate that we are using (and certainly deriving great benefit from the use) a certain description of limestone, but which is not gypsum. If this is a fact, it goes to confirm the idea, that limestone, in a pulverized state, is equally fertilizing as gypsum.

The subject is important to the farming interest, and certainly merits further investigation. It would not be difficult to erect machinery which would crush the hardest limestone and prepare it for grinding in a common plaster mill.

The facts presented above, and the questions growing out of them, are curious and interesting, and well worthy of the investigation which it is hoped will be bestowed on them. But although it seems sufficiently proved (supposing the specimens to have been fairly selected) that the plaster of N. York (or what is called plaster) generally has a natural admixture of carbonate of lime, it cannot be possible that it is wholly of the carbonate—or that it is *not* gypsum, but a limestone formation. It is sufficiently remarkable if the admixture of carbonate of lime, if in considerable proportion, should to this time have escaped the observation, not only of the plaster dealers, and of the intelligent agriculturists, but also of the chemists and geologists who have examined this extensive and valuable formation. The doubts suggested on this head, will, doubtless, serve to bring forward early and satisfactory explanations. The description given of the substance sold by Mr. Moore for plaster, in addition to the test of the acid applied producing effervescence, leaves no doubt of its being principally composed of carbonate of lime: but with all our confidence in this form of lime, as a manure—and deeming it, when applied in sufficient quantity, far better as an improver, than gypsum—still we cannot believe that it can produce, in such very small quantities as gypsum is given, effects that could be mistaken for those of gypsum—or indeed any effects that would be certainly perceptible. Pulverization would greatly aid the immediate action of shells, or limestone, by enabling every atom to operate at once: but even with all this aid, the effect of sowing a bushel of pulverized limestone, or shell marl, could not be mistaken for that of gypsum. Our inference is, that, Mr. Moore's limestone (or marl) contains a large proportion of gypsum, or of some other fertilizing substance than merely the carbonate of lime.

If we have not misunderstood the words of the private letter which accompanied the foregoing article, the writer had sent the same to the Journal of Science, and in that case, the subject will, doubtless, be properly attended to by Professor Silliman. Though not authorized to use the name of the writer of this communication, we can say that none would be better authority.

MACLURA FOR SILK WORMS.

To the Editor of the Farmers' Register.

In one of your late numbers I noticed an article translated from a French work, giving an account of the discovery that the Maclura, or Osage Orange, is a valuable food for silk worms. I have not the No. of the Register to refer to, but the article, I think, attached great importance to the discovery, and awarded very considerable credit to the dicoverer, claiming both for the credit of France. Now the fact is, this discovery is purely *American*, and was made as long ago as 1829. The *suggestion*, that the Maclura would be proper food for silk worms, was made by Wm. Prince, Esq., of the Linnæan Botanic Garden, Flushing, N. Y., who requested General T. M. Forman of Cecil county, Maryland, to make the experiment. Gen. Forman's letter to Mr. Prince, giving the result of the experiment, was published in the American Farmer, vol. XI. p. 179, August 21, 1829, and I extract from that letter the following.

> "*July* 15*th*, 1829.
>
> "From the worms in their earliest stage, after being hatched, I selected a parcel, and immediately commenced feeding them with the Maclura, while all the others were fed with our native mulberry with which our country abounds. Perhaps the Maclura worms were rather better attended to; if so, it was accidental, and not intentional. I can, however, assure you, that they grew faster, and completed their cocoons from ten to fifteen days before the mulberry worms. * * * * Be assured of this, that if the quality [of the silk] is equal [to that from the mulberry] the Maclura is the plant to cultivate; it cannot be injured by clipping; the size of the leaf is a strong recommendation; it is infinitely the handsomest, and will make the most impenetrable hedge, or ornamental standard tree."

General Forman sent the cocoons to Mr. Prince that the quality of the silk might be ascertained, and Mr. Prince sent them to me. I carefully examined them, and found them equal, in all respects, to those made from the mulberry, the silk being equally strong and lustrous. So far, the Maclura seemed fully equal to the mulberry, and in some respects, far superior; but one objection could be found to its use, and that was insurmountable. The Maclura is armed with very strong and exceedingly sharp *thorns*, which render the gathering of the leaves very difficult, and even dangerous.

So much for this great French discovery. It is, however, like many other discoveries made in France and other parts of Europe. They seem extremely loath in the old countries to give the young giant genius of the new that which belongs to it. It is a singular fact, that already the United States have made more improvements in the silk culture and manufacture, than have been made in all Europe for a century, and yet we cannot be said to have *become* a silk producing people. I mean that we, although in the infancy of the business, have out-stripped all Europe in the improvement of it. I will not pretend to describe all our improvements—are they not the burden of all the newspapers in the country? But I will call your attention to one other improvement made in the United States, and also filched from us by France. In 1829, a memoir was read before a learned society in Paris, detailing the discovery that *chlorine* was an effectual preventive and curative of the *tripes* in silk worms (a disease analogous to the plague in the human species.) The memoir set forth various experiments, and extolled the discovery as of immense importance, as it in fact is, and congratulating the silk interest in

France, on their ability, thereafter, effectually to avoid the loss which they had been theretofore annually subjected by that disease. The fact was, that the *discovery* was made by the writer of this article, and published in the American Farmer long before its pretended discovery in France. I had saved my silkworms, and those of several other establishments by the aid of the chloride of lime. I published an account of it in the Farmer, (vol. XI., pp. 124, 383,) and the American Farmer was then regularly received in Paris. The most singular part of this story remains to be told. When the discovery of the Maclura for silkworms, and of the chloride for the tripes, were published here, they were scarcely noticed by the newspaper press; but no sooner did these same discoveries come to us from France, than the whole newspaperpress in the country seized upon them, and sent them to all the ends of the earth.

Excuse me for thus troubling you. I have no other excuse than a desire to see my country possess that which belongs to her. I cannot patiently see her thus filched of her good things.

Yours, &c.,

GIDEON B. SMITH.

For the Farmers' Register.

CLOVER AFTER CORN.

In the early part of July, 1835, when giving my corn its last ploughing, I sowed clover seed on about half an acre, immediately after the ploughing. I did not see the land until September, and then observed that the seed had been sown very irregularly, or had not stood well, if they had been distributed with regularity. Some parts were well covered with plants—but generally they were too thin, and many small spots were bare. I then supposed, and still believe, that the fault was in not sowing regularly. The land was too light for clover—was originally very poor—but had been well marled, manured slightly, and I believe, was afterwards plastered. The place was again observed on June 14, 1836. The clover was of the sapling, or late kind, and was just getting into bloom, and of course had not reached its full growth. Still it was so luxuriant in the best spots as to have been partly lodged by the rains—and though most of the growth in other spots, was inferior, the whole was full as good as I could have expected on the like land, if sown in clover on wheat (as usual) in the early part of 1835, half a year in advance of this sowing.

I was much pleased with this result—supposing it to prove the certainty of getting a good and full crop of clover, the next year after corn; and I determined to sow 20 acres or more of my present corn crop. But my ardor was somewhat moderated by hearing from a very trustworthy and respectable overseer of one of my neighbors, that he also last summer had tried the same experiment, and that though the seed came up well, they nearly all died in August. His sowing was in June—and the seed raked in on half the ground for a better trial—and for both these reasons, I should have supposed, his clover had a better chance to live than mine. But without knowing the cause of the difference of result, I state the facts as I have either seen, or heard them.

If, (as I would have inferred from my own experiment alone,) a good crop of clover could be counted on from this mode, as surely as after wheat, the adoption of the practice would promise considerable advantages to both the three and the four-shift rotations—serving to free both from the strongest objections to which they are now liable. I will now merely allude to some of these, hastily and concisely, and request that they may be considered by any of my brother farmers who will repeat my experiment of sowing clover on corn this summer—as I shall do, and report the success, or the failure, next year.

If the usual three-shift rotation of 1. corn, 2. wheat, 3. clover, could, by adopting this practice, be changed to 1. corn, 2. clover, 3. wheat on clover lay, (or fallow, as it is commonly and improperly termed,) it seems to me that the following benefits would be found.

1. The usual and remarkable superiority of product of the wheat crop upon a good coat of clover, *well turned in*, over that of wheat after corn on the same land, would be gained. This is often equal to 100 per cent.

2. The corn, by following wheat, would probably be less in average product, than if after clover—but probably the diminution would be much less than the gain in the wheat: and this diminution be compensated by the advantages of ploughing clean stubble land, instead of land foul with clover and weeds. The previous growth of wheat, (especially if thick,) would not only clear the land of obstacles to good and easy tillage, but also of the cut-worm and other insects which the clover nourishes, and which are destructive to corn culture in proportion to the prevalence and the success of the improvement by previous clover manuring. One of the greatest recommendations of a crop as the precursor of another in a rotation, is that it destroys the insects that would prey on the succeeding crop. I think that this good effect for corn is produced by its being preceded by wheat—and also to wheat, by its being preceded by a heavy, smothering crop of clover, well and deeply turned in: and that the corn crop does not do any such service to a succeeding crop of wheat—and that clover actually breeds devourers for a succeeding crop of corn.

In the four-shift system, still greater, though different benefits, would be found, by changing any of its present forms to 1. corn, 2. clover, 3. wheat on clover lay, and 4. clover after wheat—and then recommencing the rotation with corn on clover as now practiced, where two years in clover (or clover and weeds) are allowed. But I have already said enough in anticipation of sufficient and satisfactory experiments of the foundation of these plans, namely, making clover to succeed corn.

E. R.

THE SEASON AND STATE OF CROPS.

From all the accounts before us, public and private, it is inferred that the wheat crop throughout Virginia, will fall short of half of an average crop—and that the whole wheat crop of the United States will be not much better than that of Virginia alone. We subjoin, in extracts from private letters, many of the facts that have reached us: but none of these, except the one from Halifax, Va., even refer to the latest and worst calamities, caused by the inundation of most of the rich and extensive river bottoms of Virginia and North Carolina. The great source of injury to the wheat, and which was anticipated as far back as last October, and expected then to be unusually destructive, was the Hessian fly. In addition to this, and to other minor evils, the very wet season latterly has done great damage, either by filling the soil with water, or entirely overflowing its surface. In the latter part of May, and first half of June, there were 21 days in succession, on which more or less of rain fell—and some of these rains came in floods: and even since the close of this uninterrupted series, there has been an unusual quantity of rain. On high land, the usual estimates of crops expected, vary from one fourth to three fourths of an average. In some fewer cases, they are worse and better than these ordinary extremes, varying from nothing worth reaping, to nearly a fair product. Of the latter cases, very few have been heard of—and those not very lately. From the newspapers, we learn that in Buckingham and the nearest adjacent counties, the wheat was tolerably fair, and near Wheeling, still better: if so, these are the only parts of Virginia as much favored, of which we have heard. On our own farm, we cannot estimate the crop of wheat at more than the fourth of what the land could produce: and where the damage from the fly was the least, and the general growth the best, there the damage was greatest from *scab*, or empty or dead parts of heads. The quality of the grain will be very bad.

But the rich bottom lands on our rivers have suffered most. These have all been covered by freshets, and to very unusual depths. The Roanoke bottom lands have suffered most. The wheat there is almost entirely destroyed, as well as all other crops—and the soil itself, in many parts, has been carried off by the floods, so that the damage to the land is even of more amount than the entire loss of the year's crops.

Two more days (the 25th and 26th) have passed since the foregoing remarks were written, and on both rain has fallen profusely and heavily; the consequent increase of damage to the wheat will be necessarily great. Where ready for the scythe, it must be much beaten down and tangled by the heavy rain of last night; and where still green, there is danger of the rust coming to destroy much of the quantity and value of the small product previously expected.

June 27th.

EXTRACTS FROM PRIVATE CORRESPONDENCE.

Campbell, May 5th, 1836.

Clover and plaster produce most salutary effects on our lands, and by judicious management, I think will reclaim them at a reasonable expense. Whether they can be made to retain the fertility thus acquired without additional aid, remains to be proven.

Our winter has been severe, and cut deep into the spring, but the warm weather for the last ten days, has pushed vegetation forward with immense rapidity. The mercury stood at 92° last Saturday, and was only a few degrees lower several other days.

Corn is worth $4, fodder, hay and sheaf oats $1 25, and butter 25 cents, and other articles about in the same proportion. Notwithstanding these high prices, there is no appearance of scarcity in the country.

The wheat crop got a good start last fall, and is now promising.

Rockbridge, May 24th, 1836.

We have had delightful weather in all this month (May)—warm and moist enough for grass and wheat, and yet I hear that in many places the latter crop is declining rapidly from the effects of the Hessian fly. The cut-worm, too, is depredating extensively on the young corn, as is almost always the case in grass, and especially clover land, when not broken up in the fall or winter previous to planting.

Albemarle, May 25, 1836.

I regret to state, that the farmers are again likely to experience another disappointment in the product of the growing crop of wheat. Our prospects until the latter part of the winter, were unusually promising. The frequent and severe frosts in the month of March, were very injurious to its growth; it afterwards recovered very much, and at the commencement of the present month, the prospect was flattering; but we were not long permitted to enjoy the pleasing anticipation of reaping an abundant harvest. The ravages of the Hessian fly commenced, and it is believed at no former period have they produced in the same time greater devastation. I also learn that the crop of wheat in the valley counties beyond the ridge, have suffered severely. The weather has been very fine for the last eight or ten days, and I yet hope a great improvement from present appearances may be realised. From the remarkable late and cold spring, our corn crop is very backward. The season of late has been favorable for oats and clover, and both promise well.

Goochland, June 1, 1836.

I regret to say that I am doomed to lose my fourth crop of wheat in succession, (and all I have ever cultivated.) The fly has devoured fully one half of it, and the residue is now threatened with serious injury by the "strut," owing to the heavy rains breaking off the bloom or farina, and preventing the heads from filling. This is poor encouragement for a young farmer. So far my corn and oats are promising, and I trust the tobacco crop will succeed well, for after all, I find that is the only tolerably sure crop with us.

Hanover, June 13, 1836.

This is the first time in upwards of 20 years farming, that I have ever been doubtful whether I would cut wheat that was top-dressed. I have often succeeded well by manuring in that way. We have more cheat than usual, and more than I can well account for on any other supposition than that some came from defective wheat, or wheat injured by the fly.

Charlotte, June 15th, 1836.

We have been completely drenched with rain for something like two weeks—during which time, but little has been done towards forwarding our crops. The wheat crop in this section of the country, is materially injured by the Hessian fly—many lots totally destroyed. The tobacco crop unpromising—much, very much, has been washed away—no small portion of the crop, especially on the river and smaller water courses, yet to plant—and in consequence of continued rains, our corn crop I fear will be overrun with grass.

Halifax County, June 19th, 1836.

What shall I say to you of the farmer's prospects in this county? Hard rains and swollen water courses have nearly ruined us. The corn on the hills, sobbed by the wet, is small, and sickly, and languishing—on the creek and river bottoms, killed or washed away. The soil is deadened, and seems to withhold its nutriment from the vegetables growing in it. We have but little early corn to re-plant with, and the late cannot come in time. The wheat crop is destroyed on the bottom lands by the freshets; on the hills, it has been attacked by the fly, the rust and the scab. None has escaped all of these enemies—the crop, therefore, will fall to a third of an average one at the highest. In the midst of the desert produced by the fly and the freshets, the oat crop stands as the only oasis, a green spot on which the eye rests with pleasure. But that crop is too chaffy and deficient in grain, to avail us much in warding off famine—and let me tell you, that a very dry season from now out, would come very near producing that horrid calamity. All of our expensive bridges are gone. Banister river was higher by 4 feet than ever known before; carrying away 4 bridges, 2 cotton machines, 2 saw mills, and doing besides, immense mischief in the destruction of crops. I expect you have similar reports from most of your correspondents, and I will not dwell on a picture too old for novelty, and too gloomy for pleasure.

Permit me in conclusion to say to you, that every day furnishes fresh evidence of the great utility of the Farmers' Register. As a farmer and a Virginian, I feel my obligations to you. You have made that a pleasing science which was before a despised art in Virginia. You have dignified the profession of the farmer and its professors. The only reward which a patriot can secure in this country for his labors, is the gratitude and respect of his fellow-citizens. You enjoy these without an exception that I have heard of, and none feels them more, or takes more pleasure in expressing them than myself.

Albemarle, June 15, 1836.

The prospects of our wheat crop in this neighborhood are good upon good land and timely seeding—the late and early seedings being very much injured by fly. My own crop is one of the most promising I have ever had. Much alarm existed at our June court (1st Monday) on account of the open mesh, (or cell,) and certainly then entirely without cause, for the wheat was just in the bloom and that defect can not be perceived. The opening of the mesh and its empty and transparent appearance is the result of a vigorous growth, the germ of the grain being in high condition to receive the fructifying influence of the external bloom, and the grain cup or chaff opens wide to receive it, closing again upon it as soon as the fructification is completed. In every case where a grain forms, this external bloom is detected, deposited upon the germ within the grain cup. The open mesh, or failure of the grain, to form cannot be detected, I think until the period has arrived at which the grain should have formed.

Anne Arundel co. Md. June 6, 1836.

There will not be half a crop of wheat made n this state, and the rye crop is very indifferent. By general consent farmers here will abandon corn-ground wheat.

Matthews County, June 17th, 1836.

The distress produced by the long spell of rainy weather, accompanied with high winds which we have lately experienced in this section of country, is shocking indeed. It is thought, and verily believed, that not one farmer in ten will make seed wheat. The cotton is nearly in whole destroyed—the corn seriously injured, and in fact the entire crops of all descriptions have suffered much. About the latter part of May, I would not have taken less than $500 for my wheat crop; now, I am certain a purchaser of it as it stands, would have a hard bargain at $200. Living on a high land farm, my corn is not as much injured as many others. Under all these disadvantages, we may cheer up our spirits with the expectation of good oat crops, for which, I have never seen better prospects.

From the Genesee Farmer.

STATE OF THE WHEAT CROP IN WESTERN NEW YORK.

The season is now so far advanced that a tolerable conjecture may be formed as to the state of the wheat crop, and the effect produced upon it by the past winter. From our limited observation, and from what we have been able to learn from various authentic sources, it appears that in what is called Western New York, which is emphatically the wheat district of the state, the wheat has suffered to an extent quite equal to what was at first apprehended. The western counties extending to Wayne and Seneca may expect a medium crop—in Wayne, Seneca and Cayuga counties there is much wheat that promises well, but as a whole, it has been a good deal thinned, and many pieces entirely destroyed—while farther east, in Onondaga, Oswego, Madison and Oneida counties, the wheat has suffered still more extensively. In the most favorable sections of Onondaga, where the crops have rarely if ever failed, but few first rate pieces are to be seen; while in the less favorable sections hundreds of acres have been totally destroyed, and have been ploughed up for spring crops. The same remarks, but in a greater extent, are applicable to Madison and Oneida.

For the Farmers' Register.

COMMERCIAL REPORT.

The pressure for money. and high rate of inte rest which has prevailed for some time in the northern cities, is now gradually diminishing. Considerable relief has been derived from the recommencement of active operations by the U. S. Bank, under its renewed charter as a State institution, and by the establishment of its agencies in Boston, New York, and other places. A considerable sum of money arising from the French indemnity, has also been put into active use, and the distribution of the surplus revenue, will hereafter keep the resources of the country more active.

At this season of the year, the commercial transactions are generally more limited than at any other, and consequently less money is required in regular business; but such large sums have been invested in western lands, city property, rail road and other stocks, that the existing capital of the country appears to be inadequate to meet all the demands on it. The same remark may be applied to the laboring resources of the United States, the insufficiency of which is proved by the very high rates of wages in every branch of employment.

Of our domestic products, tobacco is the one which at this season attracts most attention. The demand for particular sorts has recently improved; say, the low qualities and the choicest for manufacturing, but good qualities for exportation are low compared with last year's prices. The general sales range from $6 to $10. The inspections in Virginia to this time, are less than last year's, but the crop in Kentucky is much greater, and exceeds that of any former year.

Flour has advanced about 50 cents per barrel, and canal brands are now quoted at $6.75. No price is yet named for new wheat—the injury to the crop in most parts of the country, is reported to be great beyond precedent, and so far from furnishing a surplus for exportation, it is apprehended that the crop will prove insufficient to meet the demand for home consumption. The rains which have prevailed with little intermission for a month past, have destroyed a great portion of that which escaped the ravages of the Hessian fly. Such an inundation has not been known for many years past, and the injury or destruction on the low grounds has been immense. Large importations of grain from Europe, have been made for some months past, and supplies from the same quarter will no doubt continue if they can be furnished.

The operations in cotton have been moderate, with little change in price. A decline in most of the European markets, has not very sensibly affected those in the south and west. Price in Petersburg, 15 to 16½ cents—in New Orleans, 13 to 19 cents.

There has been little variation in the prices of stocks in Virginia. In the northern cities they are advancing as money becomes more plenty.

The extension of rail roads in Virginia and North Carolina, is now in regular progress. All the works required to connect Fredericksburg with Raleigh, are in hand and urged vigorously. Various others are in progress or about to be undertaken. X.

June 25.

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H. L. Plummer	Warrenton, N C
Th. J. Perkinson	Amelia
Edmund Redd	Henrico
Robert K. Dabney	Powhatan
Josiah Collins	Edenton, N C
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Henry Taylor	do .
Lovick P. Thomas	Clarke, Ga
Augustus Moore	Edenton, N C
Francis Nixon	Perquimans, N C
John F. & C. Conway	Orange, Va
Wm. H. Southall	Halifax co., N C
Thomas E. Watkins	Charlotte Va
James H. Christian	Charles City, Va
William A. Selden	do.
Thomas Jones	King William
David Meade	Brunswick
Henry Fitts	Warren, N C
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Joseph Bunch	Nansemond
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Addison Whidbee	do
John N. Butt	do
John L. Bailey	do
A. W. Nolting	Richmond
John W. Custis	Accomac
William Radford	Lynchburg
A. W. Venable	Mecklenburg
James J. Hinton	Johnston, N C
Joseph Rivers	Hall, Ga.

PRICES CURRENT.

June 29,1836.

PRICES OF STOCKS.	Par value.	Offered.	Asked.	Last sales.	Last dividend for 6 mos.
BANK—Virginia—per share,	100			118	4½
Farmers',	100			116	4
RAIL ROAD—Petersburg and Roanoke,	100	119		116	5 May 1st
Portsmouth and Roanoke,	50				unfinished
Chesterfield, ($ of capital refunded,)	100			120	
Richmond & Fredericksburg,	100			110	unfinished
Greensville & Roanoke,	100			112½	do.
Raleigh and Gaston;	100			101½	do.
MANUFACTURING COMPANIES.					
Petersburg Cotton Manufactory,	100	120	121	119	6
Merchants' Do. old stock,	100	140		140	8
Do Do. new stock,	100	120			
Matoaca Do.	100	112½		113½	(new)
Richmond	100			100	
Manchester Do.	100			100	
Franklin (Paper Do.) Richmond,	100			95	
INSURANCE COMPANIES.					
Richmond Marine and Fire,	100			98	
Petersburg,	100	105		106	new.
EXCHANGE on England,		8 per cent.			

COUNTRY PRODUCE	
Corn per bushel,	80 cents.
Wheat,	None in market
Flour, superfine (country,)	$6.75 to $7
Cotton,	15 to 16½
Tobacco,	$4½ to 12
Bacon, (hog round) per lb., Western	13.
do. Virginia	14.

TO CORRESPONDENTS.

The following communications are on hand and will appear in the next No. "*On Wheat Culture*"—"*On Argillaceous Soils*"—"*On the salivating quality of Clover.*"

The loss or miscarriage of wood cuts, which were engraved by our order at the North, and shipped 6 weeks ago, has prevented the publication of the several articles for which they were designed. The loss will be supplied as soon as practicable.

☞ **The privilege offered, in Article 7 of the Conditions of the Farmers' Register, to clubs of *old* subscribers to make united payments for the current vol. at a reduced price, expires, by its then limitation, with the issuing of No. 2 on June 1st. All other articles of course remain in force.**

INLAND ROUTE

FOR NORTHERN AND SOUTHERN TRAVELLING.

THE RICHMOND, FREDERICKSBURG AND POTOMAC RAIL ROAD COMPANY,

In connection with the other Rail Road and Steamboat Companies on the route, have adopted the following Schedule, by which the daily mail is now carried.

(*NORTHWARD DIRECTION.*)

LEAVE			ARRIVE AT		
Blakely, N. C.	at	5 o'clock, P. M.	Petersburg,	at	10 o'clock, P. M.
Petersburg,	"	2 " A. M.	Richmond,	"	5½ " A. M.
Richmond,	"	6 " A. M.	Washington,	"	9 " P. M.
Washington,	"	2½ " A. M.	Baltimore,	"	5½ " A. M.
Baltimore,	"	6 " A. M.	New York,	"	11 " P. M.

(*SOUTHWARD DIRECTION.*)

LEAVE			ARRIVE AT		
New York,	at	4 o'clock, P. M.	Baltimore,	at	3 o'clock, P. M.
Baltimore,	"	5 " P. M.	Washington,	"	8 " P. M.
Washington,	"	3 " A. M.	Richmond,	"	6 " P. M.
Richmond,	"	7 " P. M.	Petersburg,	"	10½ " P. M.
Petersburg,	"	1½ " A. M.	Blakely,	"	7 " A. M.

THE WHOLE TIME REQUIRED BETWEEN BLAKELY AND NEW YORK, BEING

NORTHWARDS, 54 HOURS; SOUTHWARDS, 57 HOURS.

BETWEEN NEW ORLEANS AND NEW YORK,

NORTHWARDS, 12 DAYS AND 13 HOURS; SOUTHWARDS, 13 DAYS AND 8 HOURS.

Of the whole distance between Blakely and Baltimore, 126 miles is travelled upon Rail Roads, and 50 miles by Steamboat.

The Stage travelling, which is conducted by Messrs. J. Woolfolk & Co. and Messrs. J. H. Avery & Co., in the handsomest manner, being now only 67 miles, is becoming rapidly reduced by the extension of this Rail Road.

☞ *Passengers are never in danger of delay, preference being given to such as enter and continue on the line.*

By arrangements which this Company is making, passengers, with their baggage, will be conveyed to and from the Depot without charge. On the Rail Road, a Coach will be especially appropriated to Northern and Southern Travellers; and, in general, the Company's Agents will adopt all measures calculated to expedite and facilitate their journey.

Carriages and Horses are safely and expeditiously transported; enabling those travelling in them, with the additional use of the Potomac Steamboat, and the Petersburg Rail Road, to accomplish, without fatigue to their horses, the journey between Washington and Blakely, N. C., in two days.

The Mail Train leaves Richmond at 6 o'clock, A. M.; returning, leaves the North Anna at 4 o'lock, P. M. The alternate trains for passengers and freight, leave the North Anna at half past 8 o'clock, A. M.; and Richmond at half past 1 o'clock, P. M.

All possible care will be taken of baggage, but it will be carried only at its owner's risk.

RAIL ROAD OFFICE, Richmond, May 14, 1836.—*tf.*

Haller

THE

FARMERS' REGISTER,

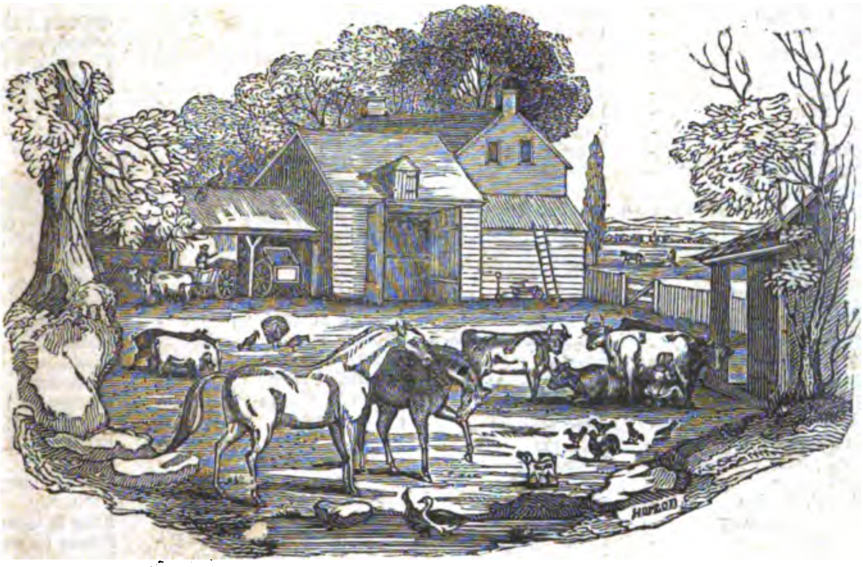
A MONTHLY PUBLICATION,

Devoted to the improvement of the Practice,

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.



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And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." *Swift.*

PETERSBURG, VA.
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THE FARMERS' REGISTER.

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EDMUND RUFFIN, EDITOR AND PROPRIETOR.

ON THE CULTURE OF WHEAT.

By Th. J. Randolph.

Read before the Agricultural Society of Albemarle, and ordered to be published in the Farmers' Register.

In obedience to a resolution of this Society, appointing essayists at their October meeting, in 1835, I have the honor to submit the following communication upon the culture of wheat.

Although deep culture is important, if not indispensable with all plants, to permit their roots to penetrate the soil freely in search of food and moisture, and to allow the water in heavy rains to subside without abrading and gulleying undulating lands, or drowning those that are level, it may be doubted whether it be proper to effect this by frequent ploughing, and intermixing too perfectly the surface with the inferior soil or clay. Nature, in all her operations, manures on the surface, and forms there the soil which is best adapted to the growth of vegetation; and if this is inverted by the plough, she reinstates it in its original position as soon as the land is permitted to remain undisturbed a sufficient length of time, by a process more rapid in warm weather, and on rich soil, where there is much vegetable matter; and slower where the land is less fertile, and the weather colder. This is strikingly exemplified by a fact well known to most farmers, viz: that when good land (particularly clover land) with a distinctly marked surface of dark soil is fallowed for wheat, sown with the harrow upon one ploughing, and permitted to lie a year or two in clover, after the crop of wheat, the dark soil is found again formed upon the surface, occupying the position in which the clay was left by the previous ploughing and the clay, that which was occupied by the inverted soil: a change of clay into soil, and soil into clay. A question naturally arises, what good results from forcing the land to this double process? I should think, none. Economy of labor, however, requires this to be done, as an expeditious mode of disposing of the vegetable matter, by burying it with the plough; but with one ploughing, the necessity ceases for that crop.

I have said that this process was more rapid on rich soils where there was much vegetable matter, and in warm weather, than on poorer soils and in cold weather. I suppose it accomplished by the gases evolved in the decomposition of the vegetable matter turned under by the plough. If the weather is warm, and the vegetation green, succulent and abundant, the decomposition is rapid, and the quantity of gas disengaged is great. Of these, the carbonic is deemed the great stimulant of vegetable life; and being heavier than atmospheric air, but lighter than the soil, it rises to the surface, insinuating itself into the interstices of the clay brought up by the plough, saturates it, and accomplishes the first process of its conversion into soil. Hence, the cause of a well known fact, that fallows made in June, July, and early in August, become many shades darker on the surface, although exposed to the scorching rays of a summer's sun, and prior to a renewed growth of vegetation upon them. Whilst it less frequently occurs on those made in September; and on those in October rarely, until the next year, vegetation being drier, less succulent, the days shorter, the nights longer and cooler, and every circumstance less favorable to a rapid decomposition in these months. A similar process has taken place on the corn land after the cultivation of the corn has ceased, and before seed time. The fertile appearance of these lands at that time is familiar to every one.[a] This recently formed and forming soil, my experience has convinced me, is the proper surface for wheat. A second ploughing, or fallow, intermixes it with the inferior soil, and the use of the large plough on corn land produces the same effect. I formerly believed two ploughings necessary as a perfect preparation for a wheat crop. When pressed for time, I used heavy harrows as a substitute for a second ploughing, often where there was a strong growth of summer grass: such portions have always produced more grain, though perhaps less straw, than that which had been twice ploughed. I once fallowed twenty or thirty acres of land in February, ploughed it with a two horse plough whenever the grass and weeds grew in the summer—it was ploughed, in all, five times before seeding on the first of October, and although it suffered from no disaster, it produced a wretched crop for the year and the land. I have occasionally coultered and harrowed small pieces of land, and prepared them without turning the surface with the plough; and have, uniformly, found the straw brighter, and the wheat more in perfection, than on the adjacent land which had been ploughed, and the surface inverted, although both were very fine. In 1822, on four plantations then under my direction, the corn crop being very forward, about half of it was removed in September, and the land ploughed with three-horse ploughs. The preparation appeared to be perfect, the earth light and thoroughly pulverized, and the grass entirely rotted: the land was harrowed and then sown, and the seed harrowed in. In the mean time, the grass had continued to grow on the portions of the field not ploughed. When the seeding of the first was completed, the rest was sown among a heavy crop of grass, with scoops, merely scarifying the surface, for nothing more could be done: the whole process was tedious and unpromising, yet the perfect preparation by which the soil had been inverted by the large plough, produced a much inferior crop to the other: the result was the same at each plantation. In putting in wheat on corn land with small ploughs, I have often laid them aside for the large plough on account of the heavy coats of grass on rich spots, old tobacco lots, &c., resuming the small plough again on passing them. The product and appearance of those spots of better land thus prepared were always inferior to that of inferior land ploughed with the small plough. I could add many instances of a similar kind with similar results.

From my observations and experience, I deduce the following conclusion.

1. That to insure the best crop, lands should be fallowed early, viz: before the middle of August.

2. That the surface acted upon by this process of a re-formation of soil, is the proper one into which the grain should be put.

3. That a second ploughing with a large plough in fallows, and its use in preparing corn land for wheat, is disadvantageous. Nature, in both instances, has prepared a better surface than can be prepared by art.

4. That the mixing the newly formed soil, fully saturated with carbonic gas, with the inferior soil, prevents as quick and vigorous growth of wheat, and as early and as perfect maturity.

If the fallows have been ploughed early, and a crop of summer grass has grown upon them, they may be stirred with the small plough or coulter, if hard, or harrowed, if mellow, so as to pulverize and smooth the surface, without regarding the grass and the wheat sown among it. The first frost kills the grass, and it acts as a beneficial covering to the wheat.[b] When the fallows are prepared, and the corn crop sufficiently forward to take off in September, the corn land may be ploughed with the small plough, and harrowed ready for seeding, and thus enable the farmer to put all his teams to the harrow, and sow a large crop in a few days. Selecting his own time for seeding, he may hope to escape the dangers of early and late fly, and do much to insure a fair crop from his land. In anticipation of this, it is desirable to plant a corn which will mature itself somewhat earlier than the kinds now cultivated. We have a corn in this neighborhood well adapted to this purpose, which yields well. If the corn is too late to commence removing in time to prepare your land in September, the balks can be broken before the corn is taken off. You will then, upon removing the corn in the latter end of the month, have only to plough the list and harrow the land, to be ready for seeding. If a proper seed bed is prepared, one harrowing is sufficient to cover the grain.[c] In the October of 1833, I had sown in this manner 300 acres in four days and a half, employing eight harrows with two horses each, and two with a yoke of oxen each; in all, ten harrows. The teams were never hurried until the last day for a few hours, when there was an appearance of rain. The same hands and teams were closely employed the next four days in putting in forty acres of rough corn land. This present month (October, 1835,) six days have been taken, to put in three hundred and forty acres of land, eighty of which were rough with stone and stumps. The team employed the same.

When tobacco is cultivated as a mixed crop, the early corn ought to be planted. It does not attain such size of stalk, and can be removed with less labor, severing it at the ground, and stacking it on the field without pulling the fodder or cutting the tops. Enough hay should be made to serve the farm, and the time given to tobacco and other operations which is usually spent unprofitably about the fodder. I am satisfied that corn is less injured to be cut up, with the fodder and top on, than to take them off and leave it standing in the field. In the first place it cures; in the latter, it withers. I have heard a judicious farmer estimate, as fair work, 200 lbs. per day, the average of hands employed in gathering and securing fodder; of hay, 1000 lbs. The use of the revolving horse-rake on smooth land would much increase the latter average. I am aware, that in recommending the stacking of corn on the field, I am running counter to the opinions of some of our best farmers. I would not recommend it where the corn could be housed; but when it cannot be done, from attention to the tobacco crop, lateness of ripening, or deficiency of labor, I deem it better to lose the ground covered by the stalks, than the greater loss from late seeding. The injury of running your teams and carts over the fields in dry weather after the wheat is sown and up, in removing the corn, I estimate very lightly.

NOTE [a]. That this process must be effected by the action of the gases, is proven from the uniform fertility of grave yards. Here the bodies do not come in contact with the surface. It must be by the generated gas forcing its way through the fresh dry earth. Would a culture of several feet make poor land rich? I think not. Manures never sink. Upon light, sandy soils, with too small a portion of clay to imbibe and retain the gases, they penetrate easily, and escape rapidly; such require frequent applications of manure, but in smaller quantities—it acts promptly, but evaporates with the culture of a crop. Stiff clays, deficient in aperient particles, are not sufficiently permeable to the gas; the particles become compacted together by rain so as to expel it before it can be sufficiently imbibed. They close so completely over manures as to exclude the air, and arrest their decomposition. Upon such soils, manure ploughed under may be found, two or three years after, retaining its original appearance, but its fertilizing principle gone; for such, straw, half rotted manures that act as a temporary aperient, are best. Sand, or some substitute for it, is necessary for its mechanical effects as an aperient to every good soil. Its excess makes a quick soil soon exhausted; its deficiency, a stiff, slow soil. In addition, there are, no doubt, chemical combinations in all soils, rendering some capable of fertility, others not. The sterility of any soil may be temporarily overcome by the application of animal or vegetable manures. But, *quære:* Will not an originally poor soil, if made ever so rich by manures, left to itself without cultivation, lapse into its original sterility? and will not one, originally fertile, when exhausted, become rich if left undisturbed long enough?

[b]. Blue grass fallows will probably require a second ploughing to destroy it. The first ploughing on this grass should always be made before the grass seeds, as the plants are easily destroyed if disturbed about the time of their seeding. If fallowing is postponed until July or August, the crop becomes very precarious. It will most frequently happen, that after much time and labor has been spent, it will be injured or destroyed by the turf. If such lands cannot be ploughed in May, or early in June, this grass may be destroyed, or crippled, by hard grazing from spring until June or July—it being a grass without aftermath, or ground leaf, each spire is a seed-bearing spire, and the grazing necessarily confined to these; and if it is not permitted to seed, it perishes. It is a grass never found upon commons, or on road sides, where it is

perpetually grazed. It will probably be found, that grasses bear grazing in proportion to the quantity of ground leaf they put forth.

[c]. Some persons object to the harrow, as not covering the grain deep enough. If a grain of wheat is buried over 2 or 3 inches deep, it forms a joint near the surface from whence (if the plant is sown early, and the fall growth vigorous) it puts forth roots, and the spire and roots below that joint perish that fall, and the plant thrives by these surface roots.

From the Repository of Patent Inventions.

OBTAINING CREAM FROM MILK.

A process of divesting milk of its component portion of cream, to an extent hitherto unattainable, has been effected by Mr. George Carter, of Nottingham Lodge, and is thus detailed by that gentleman, in a paper presented to the Society of Arts: A peculiar process of extracting cream from milk, by which a peculiar richness is produced in the cream, has long been known and practised in Devonshire; this produce of the dairies of that country being well known to every one by the name of "clotted," or "clouted cream." As there is no peculiarity in the milk from which this fluid is extracted, it has been frequently a matter of surprise, that the process has not been adopted in other parts of the kingdom. A four sided vessel is formed of zinc plates, twelve inches long, eight inches wide, and six inches deep, with a false bottom, at one half the depth. The only communication with the lower compartment is by the lip, through which it may be filled or emptied. Having first placed at the bottom of the upper compartment, a plate of perforated zinc, the area of which is equal to that of the false bottom, a gallon (or any given quantity) of milk is poured immediately when drawn from the cow, into it, and must remain there, at rest, for twelve hours; an equal quantity of boiling water must then be poured into the lower compartment, through the lip; it is then permitted to stand twelve hours more, [i. e. twenty-four hours altogether,] when the cream will be found perfect, and of such consistence that the whole may be lifted off by the finger and thumb. It is, however, more effectually removed, by gently raising the plate of perforated zinc from the bottom, by the ringed handles, by which means, the whole of the cream is lifted off in a sheet, without remixing any of it with the milk below. With this apparatus, I have instituted a series of experiments; and as a mean of twelve successive ones, I obtained the following results: four gallons of milk treated as above, produced in twenty-four hours, four and a half pints of clotted cream, which, after churning only fifteen minutes, gave forty ounces of butter—four gallons of milk treated in the common mode, in earthenware pans, and standing forty-eight hours, produced four pints of cream, which, after churning ninety minutes, gave thirty-six ounces of butter. The increase in the quantity of cream, therefore, is twelve and a half per cent. The experimental farmer will instantly perceive the advantages accruing from its adoption, and probably his attention to the subject may produce greater results. I shall feel richly rewarded if, by exciting an interest on the subject, I can produce any, even the slightest improvement in the quantity or mode of producing an article, which may properly be deemed one of the necessaries of life.

From the British Farmer's Magazine.

HISTORY OF THE NUTMEG.

The tree called *myristicka moschata* by botanists, grows naturally in a group of islands forming a part of the Moluccas, called the Isles of Banda, in the Indian Archipelago: a cluster which seems to have been thrown up by the sea in some volcanic effort, as there is now upon one of them, named Gonong Api, a volcano, constantly emitting smoke, and often flames. The first island, Banda Niera, is the chief settlement, and contains two forts: its harbor is spacious, but difficult of access. The second is Banda Lantoir: the third and fourth in importance are Puloway and Pulovun. These four islands were the only places where the cultivation of the nutmeg was allowed by the Dutch, but there are several others under the same government. What these islands produce in superfluities, they want in necessaries. The soil is a rich black mould, but it produces no corn, the natives subsisting chiefly upon sago. The nutmeg tree grows like a pear tree in form and size; its leaf resembles that of the laurel, being of a bright green color on the upper surface, and grayish underneath: when bruised, it diffuses an aromatic perfume. The flowers are white, small and scentless. The fruit is similar to a walnut in form, but more fleshy and full of juice. The external pulp dries up to a crust of a deep yellow color, which, opening at one side, discloses a membraneous coat of a beautiful red tint, known to us by the name of mace, which lies immediately over the thin and brittle shell of the nutmeg. This is the time te gather the fruit; if left longer on the tree, the mace would get loose, and the nutmeg would lose that oil, which preserves it, and which is one of the great excellences of the fruit. The nutmegs, which are gathered before they are perfectly ripe, are preserved in vinegar or sugar. The tree yields three crops annually, the first in April, which is the best, the second in August, and the third in December, yet the fruit requires nine months to ripen it: thus the tree is constantly bearing flowers and fruit at the same time. After the fruit is gathered, the outer covering is stripped off, and the mace being carefully separated from the kernel, is laid in the sun to dry. The nuts require more prepararion; they are spread upon hurdles, and dried for six weeks, before a slow fire, in sheds erected for the purpose. After this they are separated from the shell and thrown into a strong mixture of lime and water, which is a necessary precaution to preserve them from worms: with the same intention the mace is sprinkled with salt water. After this process, the fruit is cleaned, and packed up for exportation.

It appears, from experience, that only one-third of the nutmeg trees bear fruit, but this cannot be discovered until the twelfth or fourteenth year of their growth; therefore, they must not be cut down at an earlier age. The fruit-bearing property is of short duration, as the tree will yield only from the twelfth to the twentieth year, and generally perishes at the age of twenty-four years. The nutmeg tree delights in a damp soil, overgrown with weeds, and even shaded with large trees, provided it be not stifled with them. Under the shelter of the *canmarium commune* (?) it thrives very well, and bears the cold of the tops of the mountains. The fruit differ in quality according to the age of the tree, the soil, and the method of culture. The round nutmeg is preferred to that which is oblong, though they are specifically the same. It ought to be fresh, moist, heavy, of a good scent, and an agreeable, though bitter flavor, and it should yield an oily juice when pricked. The islands are divided into a number of plantations, under the management of a mixed race of Europeans and Indians. The Dutch made use of many illiberal means to secure to themselves the exclusive possession of these valuable productions; many trees they destroyed, reserving only sufficient to produce a certain quantity of nutmegs; but finding the climate of Banda very unhealthy, and that a great number of their servants fell victims to it, they attempted to transfer the culture of this spice to Amboyna; these experiments have, however, proved unsuccessful.

In 1774, the English navigator, Forrest, found in a small island near New Guinea, called Manaswary, a nutmeg tree, the fruit of which was of an oblong shape, but well flavored. This enterprising man plucked up about a hundred stems of the tree, and planted them in 1776, on the island of Bunwoot, which had just been ceded to him for the East India Company, by the Sultan of Mindanao. Bunwoot is situated to the north east of Borneo, and is a healthy spot, covered with beautiful trees.

Libilliadiere also found the nutmeg tree upon the little island of Cocos, near the northern extremity of New Ireland. The fruit, when he saw it, was unripe, and of an oblong form. The island is covered with evergreen trees, among which the *Barringtonia speciosa* is conspicuous. It extends its branches laden with flowers horizontally a great way over the sea.* There are few cocoa-nut trees, but many figs of different kinds. Fruits of several species of the screw pine, of the *Barringtonia*, and of the *Heritiera*, which trees stretched their branches and even their trunks, in a very remarkable manner over the sea. It is thus, no doubt, that the seeds of plants are conveyed from one island to another without the assistance of man. Where there are no rills to carry fruits to the sea, the want of moisture prompts these trees to bend over the ocean, and obtain from its evaporation the nourishment they require.

The principal of the Molucca islands are Amboyna, noted for the cultivation of the clove-tree; to which may be added Ceram, Ternate, Tidore, and Batchean. Ceram is a large island to the north of Amboyna. Several chains of mountains run parallel to each other in a direction from eas to west, and separated by fertile vallies containing luxuriant vegetation. In ancient times the peninsula of Hoewamochel produced large quantities of nutmegs, but the trees were extirpated by the Dutch about the year 1697. At present it is covered with sago trees (*cycas circinales.*) The wood usually called Amboyna, and the Salmoni, both of which are exported from Amboyna for the purposes of ornamental cabinet work, are mostly the productions of Ceram. Along the shores of this island, uncommonly fine shells are found.

Ternati is only about twenty-four miles in circumference. Larger nutmegs are found in its woods than any procured at Banda: but the culture of them is discontinued.

Tidore, the next of these islands, lies to the south of Ternate, and, like that island, is mountainous, and well watered by streams from peaks which are generally capped with clouds. In 1521, Juan Carvallo, one of the surviving companions of Magellan, arrived at Tidore, where he was well received, and allowed to load two ships with spices for Spain. The Portuguese and Spaniards after this traded to the island. In 1579, Drake arrived there and began to gather spices without having permission from the king, who was at first greatly incensed, but was afterwards appeased by presents. The inhabitants of all these islands are Malays.

The Chinese landing upon the Moluccas were the first discoverers of the clove and nutmeg. These new acquisitions were soon admired all over India, whence they were conveyed to Persia and Europe. The Arabians repaired to the islands but were driven out by the Portuguese, who, in their turn, yielded to the Dutch in the year 1621. After being alternately in the possession of their conquerors and the English, they were finally taken possession of by the latter in 1810. I have named those of the Moluccas only which are noted for their spices. Among the numerous small islands comprehended under the same government, are several producing various articles of exportation.

When we reflect upon such productions of nature as those of which I am treating, we must admire the beneficence of the Almighty, in having provided us with the means of varying, according to our particular taste, the flavor of the food necessary to our sustenance: how much more grateful ought we to be for those higher blessings of intelligence and industry, without which the treasures of the east would have remained confined to the distant spots where they grow. We import from these and other lands, luxuries, which by constant use almost become necessaries to us: we ought at least to bestow in return, the blessings and virtues of civilization. Many Europeans have and are attempting this, but it is to be feared that, until by some great revolution in the moral world, the degrading traffic in slaves be entirely abolished, civilization will make but slow progress in the three quarters of the world thus disgraced. We are assured that the "knowledge of the Lord shall cover the earth as the waters cover the sea," and although we shall not see that period, we must trust that it will arrive; and that then the gentle Hindoo and the savage Malay, shall be united in the bonds of Christian peace and brotherly love.—*Magazine of Domestic Economy.*

From the Arcana of Science and Art, for 1836.

EFFECT OF GASES ON VEGETATION.

M. Macaire introduced some plants of Euphorbia, Mercurialis, Senecio, Sonchus, &c. into vessels along with chloride of lime in the morning. When evening arrived the plants had not suffered, and the odor of the chlorine was as strong as at first. Next morning they were found withered, the smell of chlorine had disappeared, and was replaced by a very disagreeable acid odor. The same result was obtained on repeating the experiment several times.

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*This circumstance is remarked by every voyager passing through among these islands

Nitric acid withered the plants during the night, but in the day time merely rendered some of them brown colored.

Sulphuretted hydrogen produced no alteration when light was present, but destroyed them in the night, by the absorption of the gas.

Muriatic acid gas acted in a similar manner.

From the New England Farmer.

TO KEEP BUGS FROM VINES

A correspondent of the Maine Farmer says, I last year planted my cucumbers, &c. near where grew some tansy at one corner—soon after up, the "striped jackets" attacked them, except those in the immediate vicinity of the tansy. Observing this, I put around each hill some sprigs of tansy, which caused the bugs to leave them, and by a few applications, so as to keep it somewhat green, were kept off, as the scent is strong and I believe not agreeable to them.

C. D.

East Winthrop, May, 1836.

It is said that branches of elder laid on each hill will keep bugs from vines.

DEFECTS IN THE EXISTING LAW AND PRACTICE IN REGARD TO THE ISSUING OF PATENTS.

Extract from the Report of the Committee to Congress.

[The following extract embraces all the material part of the recent report of the Committee of Congress "appointed to take into consideration the state and condition of the Patent Office, and the laws relating to the issuing of Patents for new and useful inventions and discoveries." The draft of a bill accompanies the report, which is designed to remove the numerous existing defects of the system. This extract will be enough to show that the present system, instead of serving its intended purpose of rewarding inventive talent, and of sending abroad for general use, real and valuable inventions, serves rather to reward impostors and violators of patent rights, and to defraud both inventors and the public, by aiding and encouraging falsehood and delusion.—Ed. Far. Reg.]

The first act of Congress on the subject was passed in 1790. It authorized the Secretary of State, Secretary of War and the Attorney General, or any two of them, on application, to grant patents for such new inventions and discoveries as they should deem "*sufficiently useful and important.*" Under that act the board so constituted exercized the power of refusing patents for want of novelty in the invention or of sufficient utility and importance.—This act extended the same privilege to aliens as to citizens. In 1793, it was repealed, and another act passed, authorizing patents to citizens of the United States only to be granted by the Secretary of State, subject to the revision of the Attorney General. In 1800, the privilege to take out patents was extended to aliens who have resided two years in this country, and made oath of their intention of becoming citizens of the United States.

The act of 1793, which is still in force, gives, according to the practical construction it has received, no power to the Secretary to refuse a patent for want of either novelty or usefulness. The only inquiry is whether the terms and forms prescribed are complied with. The granting of patents, therefore, is but a ministerial duty. Every one who makes application is entitled to receive a patent by paying the duty required, and making his application and specification in conformity with the law. The necessary consequence is, that patents have, under the act of 1793, been daily granted, without regard to the question of novelty, or even utility in the ordinary sense; for it has been settled that the term useful, as used in this statute, is only in contradistinction to hurtful, injurious, or pernicious. This construction (that no right is conferred to refuse a patent) has been given to the law by the Department charged with the duty of granting patents, not so much probably from any necessary and unavoidable import of the terms of it, as from a disinclination to exercise a power of so much importance, in cases where it is not clearly and distinctly granted. And it may be reasonably doubted whether it was the intention of Congress to confer such a power on the Secretary of State alone, since no provision is made for an appeal or other remedy for an incorrect decision adverse to the applicant. Besides, any person occupying that station might be supposed as little qualified by an acquaintance with the appropriate branches of science or of the arts, to decide such questions, as any other officer of the Government. And were he to undertake the task of such an examination as would be necessary to a decision in each case, he would have little time for other official duties.

Under the act referred to, the Department of State has been going on for more than forty years, issuing patents on every application, without any examination into the merit or novelty of the invention. And the evils which necessarily result from the law as it now exists, must continue to increase and multiply daily, till Congress shall put a stop to them. Some of them are as follows:

1. A considerable portion of all the patents granted are worthless and void, as conflicting with, and infringing upon one another, or upon public rights not subject to patent privileges; arising either from a want of due attention to the specifications of claim, or from the ignorance of the patentees of the state of the arts and manufactures, and of the inventions made in other countries, or even in our own.

2. The country becomes flooded with patent monopolies, embarrassing to bona fide patentees, whose rights are thus invaded on all sides; and not less embarrassing to the community generally, in the use of even the most common machinery and long-known improvements in the arts and common manufactures of the country.

3. Out of this interference and collision of patents and privileges, a great number of lawsuits arise, which are daily increasing in an alarming degree, onerous to the courts, ruinous to the parties; and injurious to society.

4. It opens the door to frauds, which have already become extensive and serious. It is represented to the committee that it is not uncommon for persons to copy patented machines in the model-room; and, having made some slight immaterial alterations, they apply in the next room for patents. There being no power given to refuse them, patents are issued of course. Thus prepared, they go forth on a retailing expedition, selling out their patent rights for States, counties, and townships, to those who have no means at hand of detecting the imposition, and who find, when it is too late, that they have purchased what the venders had no right to sell, and which they obtain thereby no right to use. This speculation in patent rights has become a regular business, and several hundred thousand dollars, it is estimated, are paid annually for void patents, many of which are thus fraudulently obtained.

In this collision and interference of patents, the original and meritorious inventor sees his invention, to the perfection of which he has devoted much time and expense, pirated from him, and he must forego the reward which the law was intended to secure to him in the exclusive right it grants; or he must become involved in numerous and expensive lawsuits in distant and various sections of the country, to protect and confirm his rights. If he be wise, he will generally avoid the latter, and submit to the former alternative of injustice, to which the Government, as the law now is, makes itself accessary. The practice is scarcely less reprehensible, of taking out patents for what has been long in pnblic use, and what every one has therefore a right to use. The patentee in such cases being armed with the apparent authority of the Government, having the sanction of its highest officers the seal of state, scours the country, and by threats of prosecution, compels those who are found using the thing patented, to pay the patent price or commutation tribute. This exaction, unjust and iniquitous as it is, is usually submitted to.

The extent of the evils resulting from the unrestrained and promiscuous grants of privileges, may be imagined, when it is considered that there are now issued, since this year commenced, at the rate of more than a thousand a year; a considerable portion of which are doubtless void for want of originality in the inventions patented, either in whole or in some of the parts claimed as new.

A necessary consequence is, that patents even for new and meritorious inventions are so much depreciated in general estimation, that they are of but little value to the patentees, and the object of the patent laws, that of promoting the arts by encouragement, is in a great measure defeated.

To prevent these evils in future is the first and most desirable object of a revision and alteration of the existing laws on this subject. The most obvious, if not the only means of affecting it, appears to be to establish a check upon the granting of patents, allowing them to issue only for such inventions as are in fact new and entitled, by the merit of originality and utility, to be protected by law. The difficulty encountered in effecting this, is in determining what that check shall be; in whom the power to judge of inventions before granting a patent can safely be reposed, and how its exercise can be regulated and guarded, to prevent injustice through mistake of judgment or otherwise, by which honest and meritorious inventors might suffer wrong.

It is obvious that the power must, in the first instance, be exercised by the department charged with this branch of the public service. But as it may not be thought proper to intrust its final exercise to the department, it is deemed advisable to provide for an occasional tribunal to which an appeal may be taken. And as a further security against any possible injustice, it is thought proper to give the applicant in certain cases, where there may be an adverse party to contest his right, an opportunity to have the decision revised in a court of law.

The duty of examination and investigation necessary to a first decision at the Patent Office is an important one, and will call for the exercise and application of much scientific acquirement and knowledge of the existing state of the arts in all their branches, not only in our own, but in other countries. Such qualifications in the officers charged with the duty, will be the more necessary and desirable, because the information upon which a rejection is made at the office, will be available in the final decision. It becomes necessary, then, to give the Patent Office a new organization, and to secure to it a character altogether above a mere clerkship. The competency and efficiency of its officers should correspond with their responsability, and with the nature and importance of the duties required of them. When the existing organization was adopted, the granting of patents was a matter of little importance, compared with what it now is. The arts in this country were but little understood, and but little cultivated. Agriculture and commerce constituted our principal business. We had few manufactures, except those of a domestic character, adapted to ordinary domestic wants. Our work-shops were in Europe. Enterprise, in this country, ran in other channels. The war of 1812 gave it a new direction, and a new impulse, by creating an occasion for workshops of our own. Necessity became the mother of invention, and American manufactures sprang into existence as by enchantment. Their rise and progress may be dated from that period; and a more rapid advancement in the arts, and a more astonishing development of human ingenuity, have never taken place in any other age or country. This remark will appear far from extravagant to every one who will take the trouble to examine the subject. This awakening of dormant genius to a practical and active existence, next to the arousing of the political and patriotic energies of the Union, was one of the great results of that contest.—It opened to the country a new era. The nation entered upon a new existence. And since that period, American industry and enterprise, guided by American ingenuity and intellect, have achieved what would have taken Europe a century to accomplish. She has become all at once a manufacturing, as well as an agricultural and commercial nation. The useful arts have been cultivated with a success before unexampled, and have contributed, in no small degree, to the wonderful improvements which have spread themselves over our whole country. Who can predict the results, even in a few years, of that spirit of enterprise which pervades the Union, when, aided by the Genius of Invention, and propelled onward by powers which she alone can bring into exercise? The very elements are submissive to her will, and all the end less combinations of mechanism are subservient to her purposes. She participates in almost every business and employment of man. Agriculture itself might as well dispense with fertility of soil, as with her aid in its cultivation.

The greatly increasing number of patents granted, affords some indication of the improvements which have been going on in the useful arts from year to year. The average number issued annually, from 1790 to 1800, was but 26; from 1800 to 1810, the average number was 91; from 1810 to 1820, it was 200; and, for the last ten years, the average number has been 535. During the last year, there were issued 776; and there have been granted in the first quarter of the present year 274, being more in three months than were issued in the whole of the first period of ten years. In the 22 years preceding the war of 1812, the average annual number was 73. The first quarter of the present year indicates an aggregate for the year, of 1,096; the amount of the duties on which, will be upwards of $32,000. The whole number issued at the Patent Office, under the laws of the United States, up to the 31st of March last, is 9,731. This is more than double the number which have been issued either in England or France, during the same period. In England for ten years preceding 1830, the average number of patents granted in one year was 145

Whoever imagines that, because so many inventions and so many improvements in machinery have been made, their remains little else to be discovered, has but a feeble conception of the infinitude and vastness of mechanical powers, or of the unlimited reach of science.—Much as has been discovered, infinitely more remains unrevealed. The ingenuity of man is exploring a region without limits, and delving in a mine whose treasures are exhaustless. "Neither are all the mysteries of nature unfolded, nor the mind tired in the pursuit of them."

The first conceptions of ingenuity, like the first suggestion of science are theories which require something of experiment and practical exemplification to perfect. Mechanical inventions are at first necessarily crude and incomplete.—Time is required to develope their imperfections and to make the improvements necessary to their adaption to practical uses. Inventors generally obtain patents before they venture upon those experiments which only can test their inventions. They are apprehensive of being forestalled in their discoveries, and see no other means of protecting themselves against piracy and fraud, than by securing patents at once.

A remedy for this may be easily had in a provision authorizing caveats to be filed in the office. giving security to the right of discovery for a time sufficient for making the necessary experiments, inquiries and improvements.

Heretofore aliens not resident in this country, have not been admitted to the privileges of our patent laws. But, as American citizens are allowed to take out patents in England and in other countries, a principle of reciprocity would seem to require that foreigners should have similar privileges here, on paying a similar duty or amount of fees that is exacted of our citizens abroad. The fees payable in England, on taking out a patent, amount to $585. If a patent be taken out for the three kingdoms of England Ireland, and Scotland, they amount to $1,680.—In France they are $309; in Spain $292; Austria, $208.

A power in the Commissioner of the Patent Office to reject applications for want of novelty in the invention, it is believed, will have a most beneficial and salutary effect in relieving meritorious inventors, and the community generally, from the serious evils growing out of the granting of patents for every thing indiscriminately, creating interfering claims, encouraging fraudulent speculators in patent rights, deluging the country with worthless monopolies, and laying the foundation for endless litigation.

In nineteen cases out of twenty, probably, the opinion of the Commissioner, accompanied by the information on which his decision is founded, will be acquiesced in. When unsatisfactory, the rights of the applicant will find ample protection in an appeal to a board of examiners, selected for their particular knowledge of the subject-matter of the invention in each case.

By this means, without danger to actual and honest inventors, the number of patents would be somewhat diminished. But there would be more confidence in those which should be granted, and as those which have been heretofore issued, should be daily expiring by their limitation, the community would begin to feel and realize the advantages of such a change. The present law waits till infringements and frauds are consummated—nay, it even aids them; and then it offers an inadequate remedy for the injury, by giving an action for damages. It ought, rather, by refusing to grant interfering patents, to render prosecutions unnecessary. Instead of sanctioning the wrong by granting the privilege to commit it, it should arrest injury and injustice at the threshold, and put an end to litigation before it begins.

Important and interesting as the Patent Office is now considered, it is believed that, under such new organization as is contemplated by the bill presented here-with, it will contribute largely to the great interests of the country, and bear no small part in elevating our national character. American ingenuity has obtained much consideration on the other side of the Atlantic. Even the manufactures of England are not a little indebted to it for some of their most valuable improvements. Her woolen manufactures, especially, have, within a few years, undergone an entire change, by the adoption of American inventions, by which wool has been made as yielding and submissive to the power of machinery as any material whatever. Cotton machinery has also been greatly improved in the hands of our mechanics; and while England receives from us three fourths of the cotton she uses in raw material, we furnish her also with some of the most valuable improvements in the means of manufacturing it. Indeed, what mechanism or manufacture has, for the last twenty years, been brought across the Atlantic, that has not, on being returned, borne the distinguished marks of the superior ingenuity of American mechanists? Formerly, we borrowed and copied much that was valuable from Europe. Now, Europe is borrowing and copying, with no little advantage, from us; and she must not be too much surprised if she shall soon find a formidable balance against her.

From the Easton Whig.

No. I.

ON THE EASTERN SHORE RAIL ROAD.

To the People of the Eastern Shore.

On the day the Legislature adjourned, I wrote a note to two editors of newspapers, indicating a desire to trouble their types a little, as soon as I returned home and could find leisure, on the subject of the proposed *Eastern Shore Rail Road;* but although the balance of that letter was published, I am not aware the only part which I desired should meet the public eye was ever published, and that was for an invitation speedily to take up the subject for their sage consideration. I am aware that those of our countrymen whose vision has been bounded by the sensible horizon which surrounds their own domicils, or whose indolent thoughts have not been permitted to wander beyond the circle of their every day employment, or every day enjoyment, regard this scheme as one which could only have found birth in the feverish brain of some moon-struck visionary. What, say they, "a Rail Road through the E. S. Peninsula! and to be a part too of the great national works to afford rapid travel between the North and South? preposterous! monstrous!"

In the outset I profess a want of sufficient time to do justice to this important subject in hasty essays, and above all, want of time will preclude me from obtaining authentic proofs of some facts, which, nevertheless, certainly exist, and which are essential to render the case I am supporting, perfectly clear and obvious to the most incredulous; but if such of our countrymen as are now sceptical on this subject will have patience to come along with me, I will promise at least to make him doubt in his disbelief of this scheme, if I do not convince him unconditionally of its practicability at a cheap rate, advantages to the whole Shore, and profit to the stockholders. It will not be my purpose to attempt to show that there is at this time travel and commerce enough on this shore to justify from its resources the making a rail road, although I will say, that the existence of a rail road for a term of fifty years would create in that time the necessary travel and commerce; but I propose to show that there is foreign travel from the south to the north, now in readiness to support this road by its means alone, and independent of the funds to be derived from the liberal and enlightened plant of the general government which proposes to make the rail roads the exclusive carriers of the mails. While the government will save money and have the mail carried with more certainty and despatch by their plan on rail roads, it will be seen that the amount received by the roads for this purpose will be nearly entirely clear gain to them.

On casting the eye over the map of our peninsula, it will be seen that we not only have the most favoured spot, that perhaps nature in her bounty ever created on the face of this globe, for the projection of a rail road; but besides this we have a beautiful spot of earth, bearing other characteristics. It has come from the hands of its creator, with almost the same smooth finish which it could have possessed, had it been under the graduation of a corps of engineers, employed from the days of Father Noah to the present time. Our soil is emphatically fertile, and not an inch of it but may, by the use of lime, be made first rate land, equal in its general productiveness to any land in the country. Our whole shore has been overspread and shaded by rich and heavy forests large portions of which particularly in the interior still remain to attest its native origin and fertility; we are nearly surrounded by two of the noblest bays in the world, and we are cut up and intersected by navigable rivers and creeks, to an extent unlike all other spots on the face of the Globe; affording navigation for transportation from almost every neighborhood; these natural highways, many of them do not go far into the interior, and whilst they give us transportation from place to place, give us a number of luxuries for our diet, which go to supersede one-half of the labor necessary for sustenance, and exceeds perhaps in its variety, abundance, and excellence, the supply afforded by any other place on earth. It is to those extraordinary and wonderfully advantages more than to any thing else, that may be ascribed, extraordinary as it may seem, the inertness, the indolence and supineness, which has caused our population to retograde in numbers as our lands have retrograded in quality—no axiom is more true than that which alleges that men work and improve their soil, just in the ratio of the difficulty of obtaining subsistence from it. When we gain subsistence with very little labour we soon become impatient of any labour—when men are compelled to work hard every day to gain there daily subsistence, labour becomes habitual, and habit makes it pleasant.

Our shore from these very causes, strange as at first view they may seem, has fallen into neglect, and many of our most enterprising citizens are annually leaving us. The spirit of public Internal Improvements, so rife in the country, has occupied the thoughts of all our people or emigration, believing that we were without those natural and incidental advantages, which could lead to similar improvements on this Shore, and that we must therefore remain forever stationary.

A brighter day is undoubtedly dawning on this Eastern Shore, and one that is to bind her citizens to her from one extreme of our bounds to the other, a day that is to bring, and speedily, a great increase to her population, and to make the Eastern Shore that which nature intended it should be, the garden spot of the country.

Whilst there is a vigorons effort now progressing along the line of our exterior water courses to improve the soil, the interior of the Shore is every day becoming thinner of its inhabitants, and every day brings an increasing number of old fields turned out to run into wilderness or waste land. How long I would ask, would it require for the improvements now going on upon the navigable water courses, chiefly by means of calcareous manures, to reach the interior of the Shore without the aid of a rail road through it, with laterals to every convenient navigable point on both the waters of the Delaware and the Chesapeake? Ages might be required, whilst by the operation of the rail road, fifty years would not be required to place it completely on a footing throughout, with the most favored and most improving portion of the United States.

It will be borne in mind that the rivers, and creeks of our shore take their rise near the centre of the peninsula, fall to the east into the Delaware, and into the Chesapeake in the west. If you draw a line through the centre, it will be found to pass throughout our table lands, and cross cuts through more than two or three of those waters as low as navigable points. Our shore may be likened to a comb laid directly north and south, with a bar in the middle of the table land, resembling the teeth of the comb. By a straight line rail road, on this table land, as may be seen by the map, the distance will be only a fraction over one hundred miles, and on this rail road, by a locomotive, you may run a passenger from one extremity of our part of the shore to the other in three hours and a half! Then the lateral roads would throw all the meats raised on the interior of the shore to the navigable depots for their natural market, the city of Baltimore; whilst on the other hand the wood, the fruits, the vegetables, to be passed on this road, would go to the depots on the Delaware to seek their natural market in Philadelphia and New York. As return cargoes, lime, plaster and merchandize would come from both sides for distribution down the main stem of the road.

Let me ask you to allow this essay to serve as the rough outline of the plan of the Eastern Shore Rail Road, and in my next I will enter into some calculations which, although rough and hasty, will I am sure nearly approximate to truth to say this road can and will be supported alone by the foreign travel on it; independent both of the mail appropriation which it must and will have, and of the trade furnished by the country through which it passes. I will take leave to say, that, in the consideration of this subject, so vitally important do I consider to the Eastern Shore, it is to be devoutly hoped, that the narrow minded and jealous bickerings of party politics, will be wholly excluded and discarded.

I therefore hope this article will forthwith find a place in every newspaper on this Shore, as all other articles should do on the same subject, whether they be for the road or against it. Let all light be shed upon the subject. No time is to be lost, as this subject should be considered by the people, and understood by them, as well as their representatives, in time for the necessary action at the May session.

THOS. EMORY.

From the Richmond Whig.

PASSAGE OF THE MARYLAND INTERNAL IMPROVEMENT BILL.

An extra session of the Maryland Legislature was called, some weeks since, to consider the grand improvement bill for the completion of the Chesapeake and Ohio Canal, and the Baltimore and Ohio Rail Road. The bill passed the lower house on Friday, by a majority of nineteen, and had but two dissenting voices in the senate. The funds of the state are pledged for the completion of these works. This law, says the United States Telegraph, makes Maryland the great thoroughfare of the commerce of the West, and makes her the *heart* of the Union. The news of its passage was received in Baltimore by the firing of cannon, the ringing of bells, and the shouts of joyous triumph!

We take the following summary of the provisions of the bill, from the Annapolis Republican of Saturday morning.

"The law appropriates three millions to complete the Chesapeake and Ohio Canal to Cumberland; three millions to continue the Baltimore and Ohio Rail Road to the Ohio; one million to construct the rail road running down the Eastern Shore from Cecil county to Pocomoke bay; half a million for a canal to connect Baltimore with the Chesapeake and Ohio canal 'by the most northern route;' and half a million to connect Annapolis with the Chesapeake and Ohio canal. It provides for a loan at six per cent. redeemable in fifty years, for the above purposes, upon which loan not less than twenty per cent. premium *must* be obtained, amounting to one and a half million, which will constitute a sinking fund adequate to redeem the principal in——years, all the profits of the several improvements being pledged to the State for the payment of six per cent. interest upon the several sums received by them, after three years from their receiving the same."

ANSWER TO QUERIES RESPECTING HOUSING CORN OF THE LAST CROP.

To the Editor of the Farmers' Register.

Fairfax, June 7th.

Under fictitious signatures I have attempted to throw my mite into the Register, and as far as was within my very humble power, make you some return for the many good things I have received. If I aspired to the station of a public benefactor, I should have given you my proper name; but, sir, I am willing to pass through life so that my "right hand shall not know the doings of my left." If I give you brass, as brass let it go: if I give you gold, surely sir none will require that * * * or "the government" should be impressed upon it to give it currency. Rest assured that when I state any thing as a fact, I shall be ready to make the proof; as for opinions, they may and should only pass for what any may think them worth.

You ask for particulars in relation to my corn cribs (at page 109, vol. 4.) The largest is 22 feet long, 16 feet wide, and 12 feet high. It is framed strongly, and lathed inside with ¾ plank, split into slats 3 or 4 inches wide. The other two are of logs resting upon each other with spaces as wide between the logs as we could contrive, and are 20 feet long and 14 feet wide—lathed upon the outside. My memorandum book informs me that upon the 2nd day of October, I began to husk and loft corn; upon the 8th, I had 250 barrels lofted, and that upon the 30th, one house was filled; upon the 20th November, I find this memorandum: "750 barrels of corn now lofted, 180 rejected and devoted to immediate use, and 20 barrels good, disposed of—making a total of 950 barrels." You also ask what kind of corn I plant. I can only answer that it is the best I have been able to find in 36 years: the ears are large, grains deep and hard, and matured 3 weeks sooner than any other corn I have planted; the stalk is strong but very short, and the shoot is low. I always plough seven-eighths of my corn stalks under, in making ready for seeding wheat: if they were large, it could not be done. My corn kept well—for I am puzzled to get as much bad corn as will feed my hogs.

Our wheat crop is much injured by the fly. My Kinderhook, however, has escaped, and thus far promises well. It was the only wheat last year that escaped the fly.

The rye crop is now of little value—the oat, though late seeded, is very good—clover will be short, but timothy is very promising—corn may be said to be in chancery—good counsel and hard work may produce good results.

Lime! lime! lime! is now my only cry. I cannot get shells; my only chance is down the canal to bring the rock and burn it myself. In my single glass of wine, I drink "a *calcareous* resurrection to Virginia:" she will then cease to be *old* Virginia.

* * *

[The early ripening of the kind of corn made by our correspondent, and probably the greater hardness of its grain, (as the early kinds are always the hardest,) served to make safe his early storing in such large cribs. The ordinary corn of lower Virginia, in the last very peculiar season, could not have been kept in good condition under like circumstances.]

ON THE NATURE, FORMATION, PROPERTIES AND PRODUCTIONS OF ARGILLACEOUS SOIL.

By M. Puvis.

Translated for the Farmer's Register, from the *Annales de l'Agriculture Francaise.*

EDITORIAL REMARKS.

It is but little more than twelve months since we first met with one of M. Puvis' publications—which one (the Essay on Lime) was the latest which he had then sent to the press. Since, we have devoted many pages of the Farmers' Register to translations from that and other of his pieces, some of which were of much earlier date, but which did not come under our view, and probably had never reached this country, until brought by our special order, and in consequence of the high opinion formed of the author's later writings, which had been seen in the last Nos. of the *Annales*. In presenting these several pieces, it is hoped and believed that we have both gratified and informed thousands of readers, (through the various re-publications that have been made,) and have done much to diffuse the knowledge of the value of lime as manure, and to encourage and promote its extensive application. While we have heretofore frankly stated some strong objections both to the matter and the manner of M. Puvis' different essays, we think that all of them are interesting to investigators of the nature of soils, and the action of calcareous manures, and highly valuable to those who are but little informed on those subjects, and are seeking all the instruction that they need to direct their practice. As to the main and most important opinions of M. Puvis, we could not do otherwise than approve them—for it is remarkable how closely they agree with our own, first advanced and maintained (so far as was then known,) in the Essay on Calcareous Manures. The two writers separated by the ocean, and ignorant of each other's labors, and even existence, were during the same course of time engaged in investigating the same class of subjects, and arrived (though often by different proofs, or trains of reasoning,) to the same results. The entire deficiency of calcareous earth in natural poor soils—the certainty of improving such soils by its application—and the impossibility of enriching them profitably without—the *acidity* of such soils—the effect of liming or marling a country to lessen or remove *malaria*, and its consequence, autumnal diseases—all these views are maintained by both writers—and each maintained what he then thought was as novel and unsupported by other testimony, as it was important to be made known.

The following piece of M. Puvis, though the latest to reach us, in fact preceded most of what we have heretofore had translated; and this piece, it seems, is but an abstract or new form of an earlier publication, which has not yet been seen. But though our reading and publishing of the several articles has thus been in nearly a reversed order to that of their original appearance, the injury thereby sustained has not been considerable, owing to a peculiarity in the manner or form of all these several publications, which is in general a great fault, but which in this case, (and very often in other agricultural writings,) is of much use to readers, however offensive to the critic's eye. It is the repeating, in different kindred articles, the same descriptions or opinions whenever the same subjects come under view. Thus the peculiar qualities of the "argilo-silicious" soils, which are the subject of the following article, have been described in the Essay on Lime, and elsewhere, with sufficient distinctness to enable us to know them. Our inferences in regard to them were stated in a note to the Essay on Lime, (page 363, vol. III., Far. Reg.,) and this entire article shows that those inferences were correct. In fact, if M. Puvis had been investigating the nature, and treating of the improvement, of the "ridge" lands of lower Virginia, he could not have more correctly described them, than he has done in describing soils in France. The dividing ridge or level between every two rivers, or tributary streams, in lower Virginia, is precisely like the "argilo-silicieux plateaux" of M. Puvis: remarkable for the same general features of sterility—deficiency of calcareous earth—peculiar fitness for calcareous manures—*and for being more or less subject to sickliness* in autumn. As examples exhibited are more impressive than general description, it may be observed, that the stiffest kind of M. Puvis' "argilo-silicious" soil, (precisely the soil of "*triste Sologne*"—) is presented in the body of land in Prince George county, which lies between Powell's Creek and Ward's Creek, both flowing into James River: that most of the neighboring level ridge lands between other streams, (and through which the mail road passes) are examples of the medium texture: and that below, in Surry, the ridges are more sandy, indeed very light, yet still exhibiting the same general qualities. Every county in lower Virginia (if not elsewhere) will furnish abundant specimens of all these varieties of texture. Though varying greatly as to the predominance of sand or clay, there is, throughout, the same general character. We were, long ago, forcibly struck with this very uniform character of a great extent of our country, (as described concisely in Essay on Cal. Man. p. 40, 2d Ed.) and thence supposed that there had been a similarity of geological formation, different from that of the lower and more fertile lands intersecting this steril region, and different from that of any other region ever heard of, until we recently met with the writings of M. Puvis, and his description of precisely similar lands in France. We are rejoiced to be enabled to call his support to the aid of improvement in Virginia and other Atlantic States: for all that he says, in this article, is as applicable to our country as to France. Whether his geological views are plausible or not, we are not qualified to decide: but at any rate, they, and the facts by which they are supported, are curious and interesting.

The classifications of soils by writers on agriculture seem to have been hitherto of little utility. Till now they have aimed to class them by means of their texture, or different degrees of consistency; and this method has brought together soils different in nature, properties and composition. Hence it has resulted that the classification, instead of simplifying matters has only rendered them more complicated; and in this instance, as in some others, science, by a classification at variance with nature, has retarded, rather than advanced practice, and has introduced a vexatious confusion into agricultural works and theories. This serious inconvenience would not have occurred if lessons had been taken from practice in this question. Every where experience has taught the husbandman to divide the soil into two classes, distinct in their nature, their composition, their properties and productions: it is this unscientific *(empirique)* classification which should have been followed; and then we should not have been lost among the English "*loams*" of which we cannot ascertain the exact quality, now the "free lands," *(terres franches,)* nor "fat clays;" *(luts gras,)* of our French writers, which also occasion misinterpretations in each country.

The great author of all things, in his supreme wisdom has fortunately varied the comparison of soils but little. Among the vast multitude of simple substance of which the globe is composed, he has scarcely admitted more than three to form its surface—that part destined to support its inhabitants: these substances are silex, alumine, and lime. A greater number of component parts, by diversifying the nature of the soil, would have made agriculture much more complicated—and it is already, in the actual state of things, so difficult an art! If it had been necessary to practice husbandry upon a soil composed of numerous elements, it would have been almost entirely above human intelligence.

Among these three earths, the two first, silex and alumine, form almost the whole mass of the upper stratum, and exclusively compose more than half of it. The silex is found in the form of sand, and the alumine is scarcely ever met with alone, but it exists in the soil under the name of argil [pure clay] clay, always mixed, or rather combined with particles of silex very minutely reduced.

When lime, or rather the carbonate of lime, is found mixed in a greater or less proportion with the two first earths, it modifies their nature in whatever quantity it may be found mixed with them: the compound then takes the name of calcareous soil, and its properties are changed in a remarkable manner.

Sometimes the lime is mixed with a little magnesia, which then changes all the characters of the calcareous soil and most frequently renders it barren.

With these three principal constituents there is found mixed more or less of vegetable mould, *(humus,)* the decomposed remnants of preceding vegetation, or additions made by man to increase fertility; and, finally, a small portion of oxide of iron is very often met with, which does not seem to act an important part in vegetation.

Practical agriculture has learned in each country to divide the soil into *silicious*, and *calcareous lands.** In Ain, Saône-et-Loire, and Jura, and in a great part of France, the argilo-silicious land, *(terre argilo-silicieuse)* bears the name of *terre blanche* and the calcareous lands receive names which distinguish them from it completely; in the south the argilo-siliceous lands are called *boulbeuses*, and the calcareous lands *terres fortes*, in Yonne they are distinguished as *terre de puisage* and *fortes terres*, in Aveyron the one has the name of *segallas*, and the other that of *causses*; in Berry and the Gâtinais the first is called *terres de Sologne*, in Belgium and the north it is called *terres a bois, terres élytres.* In fine, practice has every where given a distinguishing name to this nature of soils, which every where offers the same composition, the same properties, the same productions and the same difficulties in its cultivation.

It is this classification, this distinction of practice that I propose to examine particularly. So long ago as 1811, struck with these two great natural and practical divisions, I published a memoir on this subject. Since then I have felt more and more the great necessity of it, and my present work, which is the study of the first class of soil, of the soils composed of silex and argil will be, in some sort, a developement of facts in support of my work of 1811. Hereafter we shall be able to return to the study of calcareous soils.

Our subject will lead us to some details of agricultural geology, a science yet in its birth, for which as we proceed, we shall collect some materials.

I. The soil of which we are going to speak is not to be confounded with the granitic or schistous soils which cover the most elevated parts of the globe. These last soils offer indeed an analogy of composition and productions with the former; they are also composed of alumine and silex—but they abound in granitic or schistous fragments of various magnitudes, which are not met with in like manner in the argilo-silicious *plateaux*; they produce, as these last, the heath and broom, but the fern does not grow abundantly on them. Their formation is not the same, the exterior characteristics and the sub-soils are different; the granitic or schistous soils seem to have been owing to decompositions of granite or schist on the same spots by meteoric influence; at other times they have been produced by the movement of partial waters in the interior of basins.

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* Here and elsewhere the author uses the term "silicious soils" in contra-distinction from "calcareous"—or to designate soils which are not at all calcareous. We have elsewhere used the term "acid soils" for the same general class.—Ed. Far. Reg.

The argilo-silicious soil, on the contrary, belongs, as we shall see hereafter, to a great deposite which seems to have been general; but which, however, did not rise to great heights. It covers, in France and elsewhere, vast extents, and it composes at least three fourths of our forest lands in the plains; the great forests in the neighborhood of Paris and those of Normandy are almost entirely composed of it. It is the only great shade of soil which is produced every where with striking analogies in its soil, its sub-soil, its properties, its advantages and its defects; while other natures of soil offer great disparities among themselves in the different positions in which they occur.

Its composition, in the first place, as we have previously announced, is completely identical, but it varies much in consistence, and in the faculty of retaining water, according to the greater or less quantity of clay which it contains, and as the silicious sand found in it is in a state of more or less minute division; for the experiments of Thaër, Schubler, and Cadet Gaussicourt, have proved that the stiffness of a soil and its *impermeability* (impenetrability to water) depend on the minuteness of division of the silex, as well as on the proportion of clay that it contains. Silex in the form of coarse sand takes only one fourth of its weight of water, while reduced to an impalpable powder, such as is obtained from clay, it retains nearly three times its weight; which explains, on the one hand, the great humidity of argillaceous soils and on the other the great contraction that clay suffers either by drought in agriculture, or by heat in the arts.

II. The color of the surface of this soil, when it has been long exposed to the air, is white, which has given use to its name of white land, *(terre blanche, terrain blanc.)*

What characterises this soil particularly is that when it is dry, it is easily enough penetrated by water, but when once saturated, it admits no more; the water which then falls upon its surface remains there without being able to penetrate it; this property has caused it to be called *impermeable* soil, because in fact it does not permit the water to pass through to the lower strata.

One of the worst results of this *impermeability* of the soil is the unhealthiness which is experienced in a greater or less degree wherever this soil occurs: the intermittent fevers which are observed more or less on the borders of stagnant waters are very frequently endemic on the argilo-silicious plains, although they may present neither marshes nor ponds.

This unhealthiness, it appears, may be explained in a plausible manner.

The water with which the soil is inundated, not being able to escape in any direction, remains there in a state of stagnation, the general principle of the corruption of water. It forms then in the soil a kind of interior marsh; the sun and the dryness of the air exhale a part. These waters, motionless, diminished, heated by the sun in the warmth of the long summer's days, ferment, become altered, and are sometimes so much corrupted as to become black; they are then an unwholesome drink for men; and at the same time the exhalations of a soil impregnated with corrupted water become unhealthy, as those of the borders of marshes, of ponds, and of all lands temporarily inundated, and which the summer's sun strikes upon, after the waters are drawn off. Then among the inhabitants of a district, in the midst of an atmosphere mixed with deleterious exhalations, numerous intermittent fevers occur, without any necessity for the appearance of marshes or ponds in the country.

III. Almost always under the white [or light colored] upper soil, a sub-soil is found of clayey sand (*sable argileux*) reddish and shaded with gray, or more rarely with red veins.

Its color may enable us to form a judgment of its degree of *impermeability*, and consequently of the degree of humidity of its surface: when the whole mass, soil and sub-soil, is gray, it is more impermeable, and its upper stratum is more wet: when the inferior stratum is reddish or veined, the soil allows the surface water to penetrate a little more, and the upper layer is better drained; it is then remarkable that the gray veins which it contains are more moist than the rest of the mass. The gray color, doubtless arises from the greater abundance of clay, and the red announces a greater proportion of sand, colored by the oxide of iron.

Nevertheless in all its varieties, this stratum retains the water on its surface in a greater or less degree, and allows scarcely any to penetrate into the interior of the soil.

IV. The argilo-silicious formation covers vast extents of the two grand divisions of which France is composed, the basin of the Mediterranean, and that of the ocean. In these two positions, so different, although near, we are unable to assign to the deposites of this stratum shades of difference which may very sensibly distinguish them. That which covers a part of the basin of the Rhone, the only basin of France which declines towards the Mediterranean, presents, then the same characteristics as in the other parts of this country which decline towards the ocean. Nevertheless, in the basin of the Rhone, the alluvion may be more clayey, a property which it shares with all the different strata of the surface of the soil in this basin.

The cause of this may be attributed to the numerous formations of gray clay, which we shall call granitic clay, that are found in this basin; and besides, to this circumstance, that the river which occupies the bottom of this basin having a much greater descent than those which flow to the the ocean, (since Geneva is 300 toises above the level of the sea, consequently in a course of 120 leagues the river falls 300 toises,) the soil there has been more profoundly agitated, the plastic clay has been dissolved in greater masses, and has given more stiffness to all these strata of the basin, and first to the argilo-silicious formation.

V. This formation, generally, covers the *plateaux*, [ridges, or table lands] which separate the basins of great rivers, whenever they are not divided by elevated mountains; and when mountains divide them, this formation often rises on their slopes to very considerable heights. Thus it is found on the first steps, or ascent, of the mountains of Autumnois; it is found covering the granites of a part of Haut-Charolais, of the mountains of Forez, and rising to almost equal heights on the two slopes of those mountains which decline, on the one side to the Loire, and on the other to the Rhone—that is to say, to the ocean and to the Medeiterranean. But then the difference of stiffness is sensible between the formation on the side of the ocean, and that on the side of the Mediterranean.

It is found at an almost equal height in the environs of Lausanne in Switzerland, of Thonon in Savoy where it rises above the alluvions of the borders of the Lake of Geneva. The great argilo-silicious table land of the basin of the Rhone, which from the gates of Lyons, covering a part of the departments of Ain and of Saône-et-Loire, reaches to the middle of that of Jura, rests on elevated *chaussées* of the granites of ——————* near Lyons: and what is very remarkable, is that, as we have said elsewhere, the general declivity of this *plateau* lies in a direction contrary to the course of the rivers which border it; that it goes on increasing in this direction for the 20 leagues of its length, so that the *plateau* towards the heights of ——————* ends by rising nearly 100 toises above the course of the rivers which bound it on the two sides.

VI. The fragments of rocks which this formation contains, are always pieces more or less rounded by the movement of waters, and the largest are generally found at the greatest depth. The strata are always horizontal, the sand is almost always coarser in the inferior strata, and its grains are successively finer up to the surface, where they are very minute. All these circumstances evidently indicate successive precipitations from a liquid, in the bosom of which the suspended earthy particles have been at liberty to obey the law of their gravities. It is then an aqueous deposite which has extended itself over vast surfaces. Nevertheless, it is not to be believed that this deposite has been for a length of time carried along by the waters before its precipitation, for it frequently contains fragments whose angles still remain and which have not been rolled long enough to become round. In the basin of the Seine the flints of chalk beds, which are there met with with still preserve, in part, their native forms; and the fragments of mill-stone *(silex carié)* which are found in Sologne are not yet rounded, although they have been rolled; and finally the rolled flintstones which are found in the argilo-siliceous deposite of the Rhone belong to the ancient alluvions of the basin, and have not received their form in the various movements of the deposite in which they now occur.

VII. Every where this stratum covers the great formations and is no where covered by them; it is then evidently the last of the great alluvions of the last great revolution which has agitated the surface of the globe.

VIII. It does not appear possible to attribute it to fresh waters, to the formations, always partial, of river waters, which take a distinct character in each basin, and generally occupy its bottom. We do not find in it the fresh water remains so numerous in marls, as well the stony, as the earthy kinds; and, besides, when the basins of rivers are not separated by mountains, this formation, occupies the whole extent of the intermediate ridges or table lands. Finally, the alluvion placed in the basin of the ocean rises on the slopes of the mountains to the same relative height as that placed in the basin of the Mediterranean; and where these mountains are depressed, the strata of this alluvion unite, and are counfounded.

This stratum of identical composition which covers such vast extents in countries distant from each other, which has risen above the basin of rivers, which unites the basins of seas, can, it seems only be owing to the last phasis of the movement of great waters, of the movement of seas themselves confounded together.

It is true that few marine remains are met with in this stratum: the few petrified sea-urchins, which are found in Sologne may there be contemporary with the beds of mill-stones which crop out through the argilo-silicious stratum, and the formation of which rises far beyond that of the deposite by which it is covered.

IX. This stratum must then have been deposited by the water over the whole surface; and it would not be difficult to explain how, while continuing to cover the ridges and table lands, it may have disappeared from the bottoms of the basins which it covered. When, by a course of which we are ignorant, the level of the inferior waters was lowered, currents were formed in the interior of the basins of the rivers which terminated in the great reservoirs; the waters quitted the high lands, to collect together in the basins, their natural bed; the waters of the elevated parts of the table lands, to reach their respective basins acquired but little rapidity in their courses of short extent, and only carried off more or less of the last deposite, which was not altered in its composition. But it was not the same in the bottom of the basins; there, rapid currents of great length were established; and impelled by the waters above, they swept off the last deposite and mingled its elements with the deposites of the inferior strata.

When the waters became less rapid, the fragments which they carried along, were successively deposited, commencing with the heaviest; and as they approached a state of repose, the minute particles which the waters retained in suspension were precipitated, and formed the upper stratum, which has become the vegetable stratum [or mould] of the lower part of the basins, and which is composed of fragments of all the formations carried off by the the waters, the latest as well as the most ancient.

X. This is the place to remark that the argilo-silicious deposites which cover the *plateaux*, generally increase in stiffness as they approach the sea; thus, in the basin of the Loire, the sands of the Sologne are lighter than the same kind of table lands of La Sarthe; so also, in the basin of the Seine, the table lands of the Gâtinais, and of the forest of Fontainebleau, are less stiff than the analogous ones of Bernay, and of the forest of Larche in Normandy.

The causes which have brought about this state of things may be conceived: the sandy particles must have been first deposited, and have formed the alluvions of the more elevated parts of the basins; the waters on retiring have left them successively exposed, and the fine and clayey particles, remaining last in suspension, have been progressively more numerous in the deposites as they approached the sea, and consequently have rendered the alluvions more stiff, more clayey. Thus the soil of the borders of the Seine which often shows little stiffness at Paris, acquires more as it approaches the sea: and in like manner the *littoral* soil of the three rivers, the Rhone, the Saône, and the Aisne, is lighter before their confluence, than that of the Rhone in Comtat, and that of Comtat is less clayey than that of the great plain of Arles: these facts are explained in the same manner as the preceding.

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* These blanks occur in the French publication and probably were made necessary by the illegibility of the manuscript. In the several pieces by M. Puvis, as published, there are numerous indications of mistakes of the author's words; and sometimes others of his meaning—so manifest, that the translator has ventured to alter them.—Ed.

XI. Finding myself involved in the great questions of the formation of soils, I shall not hesitate, at the risk of digressing from my subject to collect here many important facts in agricultural geology.

The argilo-silicious deposite has been very evidently the last of the great deposites which have covered vast surfaces: it is, in some sort, the last phasis, or general movement of waters, on the surface of the earth; but since then, partial revolutions seem to have taken place in the basins of large and small rivers; there are even some to which we seem able to assign an era, and which do not go beyond the historical ages. Thus many positive and very remarkable facts may induce an opinion that in the basin of the Rhone a great movement of waters must have taken place since the establishment of the Roman dominion in this country. When wells are dug at Marseilles, water is found under a stratum of gravel about 20 feet thick, at its junction with another formation on which we meet with traces of habitation, roads, Roman, Phœnician and Gallic medals. This level of the soil has then been inhabited, two thousand years or more ago, and consequently the stratum of gravel more than 20 feet thick which covers these parts of the basin has been brought into them since, by a movement of waters which no historical recollection recals.

But if we remark further that in ascending the basin of the Rhone to Arles, to Orange and Valence, to Nîmes, to Lyons, the traces of Roman inhabitation are evey where covered with a stratum of gravel many feet thick—that at Bourg, situated in the same basin, are found medals, instruments of a contemporary date and of the same sort as those met with at Marseilles, and every thing which characterizes an ancient level of habitation between two strata of gravel analogous to those which cover them elsewhere—we shall have good reason to believe that the stratum above the medals which have been found, must be owing to the one same revolution, which consequently must have changed the whole face of the lower part of the basin of the Rhone.

This stratum at Marseilles, and in the greater part of the places where it occurs, cannot be owing to the ruins of habitation, to the rubbish of destruction, which raises the inhabited surface in populous cities; for the traces of habitation, the medals, the roads, mould (humus) bricks and pottery, in angular pieces, would be found throughout the whole thickness of the stratum, whereas this is composed without mixture of rolled pebbles of silicious gravel of the same kind, covering calcareous gravels disposed in horizontal strata, identical in thickness and in composition, which could be owing only to a natural formation deposited from the bosom of the waters.

But still farther traces of this inundation are found. At the junction of the basins of the Ain and the Rhone, there exists a great plain which bears the name of Valbonne, (*Vallis Bona;*) a name evidently given by the Romans, and of which the soil is now composed of an arid stratum of silicious gravel like that which is found all along the basin of the Rhone; but we should consider as certain, that this stratum did not cover the valley when it received the name of *Vallis Bona;* it may then be believed, that the alluvion of good quality which covered this valley, was carried off by the great flood which has thrown over a great part of the surface of this large basin, all those increments of gravel which have covered and devastated the inhabited surface. In support of this conjecture, we find in Bas-Bugey at Meximieux, and in Dauphiny, at Saint Priest, opposite the plain in question, a stratum of calcareous soil of good quality, which often rises many feet above the alluvion of gravel, this stratum, which at several points bears traces of having been torn away, rose, it may be believed, above the borders of the Ain and the Rhone; it covered, consequently, the plain between Meximieux and Montluel, and gave occasion to its name of *Vallis Bona,* which was preserved to it after the waters had deprived it of its qualities. An aqueous revolution then has taken place in the basin of the Rhone; this revolution must have been subsequent to the establishment of the Roman power, and to this revolution the stratum of silicious gravel succeeded, which from the borders of the lake of Geneva, to those of the sea, covers such vast extents.

We shall not continue farther the discussion of this important question of agricultural geology, for fear of exceeding the proper limits of this journal.

XII. In all movements of great waters which have taken place, each basin of a river has formed a new upper stratum which has become the vegetable stratum (or surface soil;) and this is distinguished by shades of formation which are peculiar to itself, and which it has received from the fragments of the mountains which border upon it, from those brought by the waters of its confluents, mixed with the great general deposites. Thus are explained those analogies of soil and of formations which are found throughout the whole extent of any one basin, and in the secondary basins themselves.

We have designedly gone back to the origin of these analogies of soil, that we might recur to an important idea in agriculture. It is this: that the formations in any one basin being composed of the same fragments, and owing to the same revolutions, the soil of these basins presents throughout their whole extent a great analogy, and consequently, the practices of agriculture which have succeeded in one point, may be applied, the difference of climates excepted, to the analogous formations; agriculture perfected on some points of a basin, may give lessons almost certain for its whole extent.* Thus the study of agriculture, to become more profitable, instead of being made according to a political association, by Departments for example, ought to be made by the basins of rivers; it would give rise to many fewer mistakes, and consequently, to much more success. The rules and successful practices of a basin, should be studied anew, if we wish to make an application of them to another basin in which the composition of the soil is owing to different circumstances.

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*It may not be useless to all readers to say, that by the "basin" of a river, the author does not mean merely the valley or lower lands through which it flows, but the whole area, high and low, which lies within, or is intersected by, all the tributary streams of the river. Thus the basin of the Mississippi takes in the immense area from the summits of the Rocky Mountains to those of the Alleghany.—ED.

XIII. This caution, this fear of mistakes, ought to have its full effect when agriculture is practiced on the great argilo-silicious deposite which covers such vast extents, and presents every where the greatest analogy. The practice of agriculture on this deposite, might then have general rules which it would be very important to collect; but it must first be well characterized, in order that it may be every where known. We shall therefore resume the course of our observations.

The soil and the subsoil of this stratum, although of different shades, appear to be of identical composition, as experience daily proves in a striking manner. When by any circumstance the whitish stratum of the surface is removed, so as to leave only the reddish stratum of the sub-soil, some years of cultivation and manuring, or even of spontaneous vegetation without culture, are sufficient to give to this reddish sub-soil the gray color of the rest; and, in the same manner, when this reddish earth is carried out on a cultivated soil, the shade which it gives quickly disappears by mixture with the rest, and by the effect of cultivation.

The proof of this identity is still more complete, if we remark that in digging into the lower parts filled up by the falling of more elevated portions of the soil, we find the red soil shaded with gray, or the gray shaded with red veins in the middle of the rubbish; which proves the new increment, with all the characteristics which it has elsewhere, its stiffness and its *impermeability*.

The sub-soil and the stratum of the surface, are then nearly identical, its formation throughout its whole thickness is therefore the production of the same aqueous revolution; only the oxide of iron which colors the sub-soil, loses its color by cultivation.

XIV. The effect of frost upon this soil characterizes it in a peculiar manner; the water at the surface when it is in no great quantity, often freezes in vertical threads which sometimes rise six inches, and resemble a vegetable growth. But what is still more remarkable, is, that the soil rises up by freezing much more than the greater part of calcareous or alluvial soils. New vegetables, planted, or even sown, are torn out of it in a manner truly astonishing; plantations of wood of that year, or even of the year preceding, were torn out at two different times by the freezing without snow, in February, 1831; and sowings of sea-pines, (*maritimes,*) made the year before, were thrown out of the soil. It is therefore prudent to wait till the end of winter to make plantations in such soils, and not to dig the holes beforehand, that water may not get into them and remain; and as the effect of frost is less sensible on the parts covered with turf, the little holes, after planting, should be re-covered with turf, to prevent as much as possible new losses.

The rising of this soil from freezing, occasions besides the great inconvenience of much deeper roads than on calcareous soil.

These effects are explained in a plausible manner from the nature of the soil itself. This soil contains much silex in a state of very minute division, either free or combined with the clay; this silex as we have seen, takes a greater quantity of water than other descriptions of soil; the water which penetrated this soil expands, as we know, by freezing; it expands then at the same time the soil which it penetrates; the expanded soil rises up, and raises with itself the plants and their roots when they do not reach to great depths.

The surface of the soil in thawing first, and losing a part of its water by evaporation, is contracted and sinks upon the rest of the soil, and leaves exposed a part of the roots which cannot descend again with it because their extremities are fixed in a soil still frozen: the next day this effect is renewed, and the plant is soon partly or entirely out of the ground, according to the length of its roots.

The rising of the soil is greater in proportion as it is more clayey, because then it contains more silex in the state of impalpable powder, or it absorbs more water; it is greater than in the ordinary calcareous soil, because carbonate of lime receives only 85 per cent of water to 100 of impalpable powder, while silex takes 280 per cent. There are, however, some calcareous soils which also greatly expose the roots of vegetables; these are the marly (*marneux*) calcareous soils; thus, in the freezings without snow in February last, our calcareous soils of the plateaux, whether *terres-mares*, or our marled lands, had more plants thrown out than our common white lands, (*terres blanches.*) We attribute this to the fact that our *terres mares* are nothing more than a mixture of the argilo-silicious soil of the plateaux with the inferior marly stratum; but our marl which contains commonly 40 per cent. of carbonate of lime, has 60 per cent. of clay or very fine silex, while our white lands contain a great deal of silex in the state of sand. Our *terres mares* and our marled lands, contain then, relatively, more fine silex than our ordinary ridge or table lands, and for this reason may expose the roots of plants still more.

XV. But with the same sub-soil, almost always clayey, the surface varies much in stiffness and tenacity: it passes from a state the most tenacious, and the most difficult to work, to the lightest sand, which is carried off by the wind; and yet under all these diversities of soil, there is found almost every where the *impermeable* red sub-soil.

When the upper soil is clayey, it is then *accidenté*, formed of a collection of small basins or ponds, which serve to drain it; the waters have not levelled the surface, or rather after having levelled it, they attacked it in places, and formed in it basins or hollows which receive the water of the surface, and without which it would be impossible to cultivate it.

In this case, it may be conceived that the soil and the sub-soil are in their nature clayey, of an *impermeability* almost absolute; this soil is also very wet, since it contains a great deal of fine silex, which absorbs 280 per cent. of water, and to derive advantage from it, the cultivator is obliged to add to its natural declivity by artificial beds or ridges by the plough. Wheat, rye, and most agricultural productions, succeed more or less upon it when the drawing off of the superabundant water has been effected.

The dog's-tooth grass, (*chiendent,*) agrostis stolonifera, *herbe trainasse*, the little motherwort (*matricaire*) prey upon this land and impose on it, as an absolute condition of production, the necessity of a very careful cultivation; such is, mostly, the great *plateau*, which extends from the gates of Lyons into three departments, the Ain, Saone-et-Loire, and Jura; such are nearly, also, Puysaie in Yonne, a part of the plain of Forez in Haute-Loire, and the part of Sologne in the Cher and Loire, where fish-ponds are found.

But if this soil, to yield produce by cultivation, requires to be carefully drained, the necessity for this is almost as great to produce woods with advantage, especially in the most clayey variety; without this, on its surface covered with little pools, without mellowness and without strength, the greater number of large vegetables languish; the oak. particularly, is frozen on it almost every year. Then it becomes necessary that ditches, judiciously placed, may collect and carry off the superabundant waters of the surface: with this care, the aspect of the soil changes, large vegetables grow with natural vigor, and are no longer subjected to any other than the great general accidents depending on temperature and climate.

XVI. The elevated parts of each *plateau*, when the waters have had less effect, are generally of a level and sandy soil on the borders, the lower parts are the most *accidentées* and of stiffer soil. Thus in the great *plateau* or basin of which we speak, Bresse is more moist, more clayey, more *accidentée* than Dombes, which is at once more elevated and more sandy than it; and it is the same case elsewhere in the same soils.

But this great *plateau* which belongs to the basin of the Rhone, appears to be the most wet of all those of the same nature which are met with on the French soil; nowhere is it necessary, as with us, in order to derive a profit from the soil, to cut it by perpendicular ditches into small pieces ridged in the middle, to increase thus the natural declivity by artificial slopes, and finally, to add to all these labors, cultivation by bedding or water-furrows. But what increases still more in our country the difficulties of cultivation, are the rains, amounting to 45 inches annually, which keep the surface of a soil, that does not allow the water to penetrate to the interior, in a state of inundation, unless the flowing off of the moisture is hastened by artificial means. And what is very remarkable, is, as we have just said, that the soil is more clayey in the low parts of the *plateau*, where the waters appear to have carried off a greater thickness of the strata. Thus, the soil of Bresse is more clayey and more troublesome, and difficult to cultivate than that of Dombes; in Dombes artificial ridging is less necessary; ploughing in raised beds is generally sufficient to drain off the water; and sheep succeed there, while they perish almost every year in Bresse.

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To keep the pond full during the summer, when there is little rain, which is absolutely necessary for the preservation of the fish, it is in a manner indispensable, that the inferior soil should retain the water, and should, consequently, be *impermeable*.

XVIII. Most frequently, when the soil is light, the surface is level, it is hardly ever inclined: there is only a slight slope on the nearest water courses; consequently, in such places, there are no fish ponds; the soil, indeed, still rests, almost always, on the *impermeable stratum;* but it is often at so great a depth, that the surface which suffers from wetness in rainy weather, suffers also from drought in dry, warm seasons.

These two varieties of land, the clayey and the light, although of the same nature and of the same formation, may be distinguished from each other, the first by the name of *argilo-silicious;* and the second, by that of *silicio-argillaceous* soil.

Fish ponds in the plains of the light or *silicio-argillaceous* lands, are evidently impossible, unless they could be established on the water courses which traverse them; which would destroy all the resources of the country in forage, by covering all the meadow lands.

It is of this variety of soil that is formed, in part, the *plateau* which separates the basin of the Seine from that of the Loire, which contains such vast extents of wood, and some cultivated parts; on this *plateau* are found the forest of Fontainebleau, and that of Montargis.

Such is also the part of Sologne, in the basin of the Loire, from Gien almost to Bourges, and which separates the Cher from the Loire: it forms a great *plateau*, which rises on one side above the vale of the Loire, and on the other, above the basin of the Cher; such are all the *landes* [sandy plains or deserts] of Bourdeaux, and a great part of those of Bretagne and of Maine. In this kind of soil, rye, buckwheat, and some fields of potatoes, are almost the only productions of the cultivated lands.

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XIX. On all the varieties of this soil, provided it is drained, resinous trees seem to become naturalized, and often grow even more rapidly than in the mountainous countries where nature seems to have placed them exclusively. In this soil, where the richest harvests are refused to the cares and labor of man, all the families of resinous trees often prosper better than in our gardens The larch and the forest pine (*sylvestre*) the sea-pine and the laricio grow vigorously over the whole extent of this soil, when it is laid dry, and the pine *du lord* seems of all to be that which best withstands the wetness. These make an excellent alternation with the deciduous (*feuillus*) trees. A single generation of these large trees, after having enriched man with its productions, often suffices to accumulate upon the soil many inches of productive mould.

I shall not repeat here the observations which I have already made elsewhere upon this soil, the nature and properties of which, appear to have been hitherto so little attended to; however, it is necessary to repeat that in consequence of the impermeability of the soil, the *plateaux* which are formed of it, contain but few springs; because, in the first place, the rain water cannot penetrate into the interior to form and maintain reservoirs to supply them; but especially, moreover, because the interior waters cannot, but with great difficulty, escape through the impermeable stratum, to arrive at the surface. It is probable that in this soil which confines the water, Artesian wells, to give it a passage, would have a better chance of success than elsewhere.

These table lands, having in general some declivity, enough of rain water rests on the surface to injure vegetation, but not enough to form marshes. Marshes proceeding from interior water—from waters below the impermeable stratum, are then also very rare, and can only be met with in this soil, when the impermeable stratum in the bottom of the basins happens to be mixed in places with gravel, which renders it permeable.

The small number of marshes which are found in this soil, are placed in the basins of water courses where the impermeable stratum has been diluted or modified in its nature ; they are of small extent, and could be easily drained, because the *plateaux* themselves have, generally, a very sensible slope.

These water courses, destined to receive the water from rains, and especially from the springs of a district, are then also very rare in these lands without springs; and those which are met with, are rapid, and have hollowed out deep valleys; because, the bottom of these valleys tends to come upon the level of the great rivers which flow at the foot of the *plateau*, and because the plateaux most frequently rise several hundred feet above the level of the rivers, the argilo-siliceous alluvion of these basins has been often entirely carried off.*

XX. When the argilo-siliceous alluvion is left to itself, the herbage, which elsewhere covers the soil with a close and lasting carpet, comes up upon it weak and thin; and when the surface is badly drained, its wetness is favorable to *carex* and other species generally of little substance, and even these grow badly and slowly; they are often found accompanied by a variety of moss, which covers the surface, and still more the subsoil when naked and exposed, with its whitish foliage. When the soil is better drained, heath, broom, (*genet*) sheep sorrel, spurry, (*spergule*) fern, the peculiar and exclusive vegetables of this soil, take possession of the surface at the expense of other growths. Sheep are here supported better than on the poor herbage of wetter soils; other cattle also feed and live upon it nearly throughout the summer. The soil derives remarkable advantages from these vegetables which it nourishes: man believes that he has a right to complain of them, because they present obstacles to its cultivation; but these species, larger than the feeble grasses of turf, leave more dead remains or litter on the soil, and by a happy foresight of nature, these remains are decomposed with difficulty in this inert soil, assume the character of acid mould, (*humus acide*,) and form future resources for this unfruitful land.* The plants, of the production of which we complain, are then of great benefit to this soil, or rather to us: they have changed the nature of the soil, they have furnished to it the mould (*humus*) which alone distinguishes it from its arid sub-soil, and have rendered it at last capable of producing the larger vegetables—the trees which cover it in a great many places. But in a few generations, when the previous growth of heath, or of other plants natural to this soil, has not accumulated great resources, this succeeding growth of trees is soon exhausted. It happens, then, often in this soil, which receives few of the principles of vegetation from the atmosphere, that the whole growth of woods languishes and disappears quickly from the surface; then reappears the alternate cover, or shift (*assolement*) of small plants, the producers of acid mould—and the soil, by these means, stores up new powers for

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* Instead of the plants above named, (which, except sorrel, are not indigenous, and perhaps not known here,) let the reader suppose to be substituted the names of our broom grass, the poverty (or hen's nest) grass, pine leaves, and whortleberry shrubs, and the description and the general remarks will suit well for our poor ridge lands, either in woods, or cleared for tillage and again "turned out." These poorest of our natural soils alone, of all in this region, present an accumulation of vegetable matter, so great as to be even injurious to cultivated crops—and which, in that respect exhibit many points of resemblance to the *peat* soils of Britain, which are unknown in our warmer clime. But it is not merely because the vegetable products above named are slow in decomposing, that they are thus accumulated on our author's "argilo-silicious" lands, or on what we have elsewhere termed "acid soils." The acid ingredient, or property, of such soils, is itself *antiseptic*, and therefore tending to preserve from decomposition all vegetable matter in contact. Soils made calcareous, of course lose all acid quality, and the decomposition of these, or any other vegetable remains, proceeds rapidly. Possibly, this action of calcareous earth is not merely negative—that the effect is not caused merely by its neutralizing and destroying of the antiseptic acid—but that calcareous earth may also possess a positive *septic* action, which serves to aid and hasten the decomposition of vegetable matter. Many persons, who have not been guided by reasoning, chemical knowledge or research, have formed this opinion, from observing the rapid and entire disappearance of the fallen leaves on the rich limestone forests, compared to the great and permanent accumulation on the poor wood lands of Virginia. See *Essay on Calcareous Manures*, 2d Ed. p. 31, and Ch. 8 throughout.—Ed.

Among these soils there are some, however, more happily endowed. The natural rotation then takes a different character: the larger plants continue to live upon them; different characters of these plants only, are replaced by others, and the different families succeed each other. Thus on good mountain soils we see the beech and the resinous trees succeed each other in turn, as on good soils in plains we see the birch replace the oak, which soon reappears itself after one generation of the birch.

XXI. With this great analogy in all the principal points which distinguish these soils, with their identity of composition and of production, we still, on each particular body of table land, or ridge, (*plateau*) meet with circumstances which appear peculiar to each district, and which it is perhaps important to remark. Thus on the great argilo-silicious plateau of the basin of the Rhone, as it rises towards the south and approaches Lyons, it loses the name of Bresse to receive that of Dombes; its soil becomes more sandy, lighter, and less wet, on a great extent of soil. In the most sandy and least wet parts, one of the grasses, the *anthoxanthum odoratum* takes possession every year among the rye, and covers the earth like a carpet. After harvest it blooms, and its numerous heads exhale a cadaverous odor which infects the atmosphere. Some persons are inclined to regard this odor as the principle of the endemic fever of the country; but the fevers prevail where the soil is not covered with the *anthoxanthum*.

Is this *anthoxanthum* the same variety as that of the botanists? The heads, the flowers and the leaves have a great resemblance, the odor of the two plants when bruised, is little different, the smell of the flowers even has some similarity: yet there would be, apparently, good reason to doubt their identity. The plant so called by botanists, is one of the earliest blooming grasses in the spring, and that of Dombes blooms at the end of the summer: that of the botanists has an odor which is in request to give a perfume to hay; its stalks and leaves often rise above a foot; that of Dombes only covers the soil, its flowers rise scarcely 6 inches, and give out a smell almost intolerable to those not habituated to it. Finally, that of the botanists appears to be long-lived, while that of Dombes can hardly be biennial, for it cannot establish itself in the soil in the course of the year preceding the rye during the fallow-ploughings; it must spring up, at the earliest, in October, with the rye itself, and last three months longer than it, for at the end of October its plants are almost all dry.

If there are two different varieties, it would be still uncertain whether the smell of that of Dombes were natural to it, or arose from the climate and soil which produced it. Could this soil, in which the interior waters are corrupted at the time of the flower's blooming, injure also the odor of the plant? If the two plants belong to the same variety, the question would be decided; the alteration of odor would be owing to the state of the soil at the end of summer.

XXII. What particularly distinguishes the argilo-silicious soil from alluvial soils, and others of good quality, is, that the sub-soil, which, as we have seen does not differ from the upper stratum, is entirely without vegetable matter, while we see in alluvial soils, and even in calcareous soils, mould occurring below the soil, or vegetable surface stratum. Here, there is only a barren clayey sand. Also, while in other soils, vegetables sink their roots to seek nutritive juice below—in this soil the roots run without sinking, because there is nothing to be found below the stratum exposed to the atmospheric influences. This circumstance explains, in a plausible manner, the quick exhaustion of the surface in trees on white land, (*terrain blanc*) and consequently their disappearance after a longer or shorter period of vegetation. It is for this reason, that, while in good soils trees often do little injury to crops, and sometimes even afford them advantageous shelter; in the soil of which we speak, they consume the resources of the surface, starve the surrounding vegetables to some distance, and wither them up, especially during the heats of summer. It is thought sufficient to account for this, to say, that "the shade *burns*." Yet, this ought to have quite a contrary effect, since it evidently shelters from the heat of the sun. But if we remark that this effect takes place in all exposures, that it is more sensible on the south side of trees where the shade does not fall, than on the north, which is often shaded, and that this effect does not occur in deep soils into which the roots descend, while it exercises all its ravages on shallow soils, where the roots run far to draw from the surface; if, lastly, we remark that the evil is much greater during droughts, that it shows itself much sooner on these points than elsewhere, that the evil is seen in the withered leaves of the vegetables, and with all the symptoms produced by drought, we should necessarily conclude that this effect is owing to the absorption of the humidity of the soil and of some vegetable principles, by the spreading roots of the tree at the expense of the crop covering the soil.

But a very conclusive fact confirms this explanation, already so plausible. A row of poplars planted on the edge of a field damaged the crops very much. I caused a ditch to be dug so as to cut the roots of the poplars; the following year, the crop of wheat on one part, and of clover on the other, was finer in that portion of the field which the trees generally starved, than on all the rest of the field. It must, therefore, have been the roots, and not the shade, which injured the crops, and the roots, therefore, absorbed the humidity much sooner than they consumed the vegetable juices of the soil. Yet, I would not admit that the nutritive juices could have accumulated in the soil which had to nourish, at the same time, the trees and the crop; but I think that the decaying remains of the roots, having become a vegetable nutriment, gave the advantage to those portions of the field which they formerly injured.

XXIII. This kind of soil, it cannot be dissembled, requires great intelligence and constant labor to render productive. It is for this soil that the proverb was made, "*tant vaut l'homme, tant vaut la terre*," (as man is, so is the earth;) but with great care, much labor, and abundant manures, (*engrais*) it may be raised to a production which compensates the trouble and the outlay.

What particularly distinguishes the argilo-siliceous soil from calcareous soils is, that in these last, crops without (alimentary) manure (*fumier*) grow, feebly it is true, but without appearing to exhaust the soil in a sensible degree; in the other, without manure they will scarcely grow at all. To make this soil productive, there is absolute need of a stimulant to develope its vegetable powers. and the effect of the (alimentary) manure consists as much in stimulating the soil and the vegetable organs, as in supplying them with nutritive juices. When an equal quantity of manure is given to these two soils, so different in their natures, that its effect on the calcareous soil is perhaps twice as great as on the siliceo-argilaceous soil; whence we should naturally conclude that the faculty of imbibing the principles of vegetation from the atmosphere, is much more powerful in the calcareous soils, and the vegetables it produces, than in the argilo-siliceous soil, and it is that which constitutes their greatest difference.

XXIV. But this important faculty, which nature seems to have refused to this soil in its formation, man, by a happy compensation, may give to it, with all the properties and all the advantages which distinguish calcareous soils. If he covers this soil with marl, if he applies to its surface a certain quantity of lime, or sprinkles it with ashes, or even confines himself to burning its surface, then the nature of the soil is changed; an unusual fertility appears—(alimentary) manures act upon it with more effect, and the soil receives that happy impulse which, when it is extended over the whole surface of a country, changes its entire aspect, and produces in it agricultural wealth, the assured source of prosperity, strength and population. Lime, and the substances which contain it, would then be a very powerful means of vegetation on a soil which does not contain them; spread so as to form scarcely a two-hundredth part of the cultivated stratum, it increases with the ordinary quantity of manure all the productions more than 50 per cent., during a period of more than twelve years. The calcareous particles which it furnishes to the vegetable texture, are not a millionth part of the product itself, since lime does not form a moiety of the weight of the vegetables reduced to ashes. This surplus of production which is not furnished at the expense of the soil, (since at the end of twelve years it will still be richer than before the application of the alimentary manure,) and which does not come from the very small portions of the substance of the lime, (which does not form a millionth of the production,) comes then from the atmosphere. The soil and the vegetables which it supports, have then received from the lime, and from its mixture with the vegetable stratum, the faculty of imbibing from the great reservoir of vegetable elements, carbon, azote, oxygen and hydrogen.

We shall not now expatiate further on the subject of improvements by calcareous substances: they demand a longer and more particular explanation which will find another occasion.*

XXV. Let us return to our principal subject. As we have said elsewhere, by a fortunate and beneficent harmony, the formation on which the argilo-siliceous soil rests is calcareous, and contains marl in great abundance; there is not within our knowledge an argilo-silicious *plateau* in which marl has not been found at a greater or less depth; generally, it is found where the ridge or table land ends on reaching the alluvions of the basins, and in the inflexions of the soil where the waters have carried off a considerable part of the deposite.†

On a great portion of the surface of the *terres à bois*, *terres elytres* of Belgium, and of the Department of the North, marl has been found. In Picardy, it is brought up from some depth; on the table lands of the three Departments of ancient Normandy, it is sought at a depth of 100 feet, even of 200 feet from the surface; Puisaye obtains it on the surface (in out-croppings) and Dauphiny at a slight depth.

Our great *plateau* which extends into three Departments, shows it on the borders and in the basins of the streams which water them. On most of the great *plateaux* which border on the Loire, and which form a great part of the soil of a dozen Departments, marl is frequently met with, and is in many places successfully employed. The *boulbins* of Toulouse have it also, and make use of it with great advantage.

Finally the plateau which forms the Gâtinais and Sologne, which declines partly to the Seine and partly to the Loire, rests every where upon calcareous deposites. Marl is found either on the edge of the plateau, or at a little depth in its first portions, or finally in the basins of the streams which water them. We may then regard it as certain, that generally, there prevail under the argilo-silicious deposite a calcareous formation and deposites of marl, which when brought out upon the surface may give it a fertility almost equal to that of the most favored soils.

Nevertheless, sufficiently numerous observations have often shown me a stratum, not calcareous, but resembling, in its exterior characters, the earthy marl, on the nature of which chemical tests alone have been able to undeceive me. This stratum, which is nothing else than what we have distinguished by the name of plastic clay, is met with from time to time on the table lands, and in the spots where we may expect to find marl; but it is still more frequently found at the bottom of brooks, where it serves as a sub-soil to poor meadows. I have found it sometimes in cysts (*sacs*) with marl, and by its side. I have never met with it upon the marl, but often below it: the plastic clay should then be subordinate to the calcareous stratum, as this last is to the argilo-silicious stratum, and we should hence conclude that where the plastic clay is met with, the calcareous stratum is wanting—has been carried off—and consequently marl will not be found.

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* And which has been already presented to the readers of the Farmers' Register in Vol. III. in M. Puvis' essays on lime and marl.—Ed.

†Even in this important respect, the resemblance holds between the argilo-silicious lands of the author, and the "acid" ridge lands of lower Virginia, and probably of Maryland and North Carolina. Though not the *marl* described by M. Puvis, a calcareous stratum of fossil shells underlies, at various depths, nearly the whole of this vast region: and though it has as yet been reached for use only where its out-croppings show at the surface, in future times, when the value of this improvement will be properly understood, this bed will be found and obtained by deep pits, almost in every neighborhood, and for the use of large spaces which are now considered destitute of, and entirely debarred from this manure.—Ed.

If this law of super-position exists, as is probable, it may be of great use in searching for marls; but observe, that the clay does not exclude the marl, except upon the spots where it is found; and that it is no proof of exclusion on the neighboring portions. The earthy strata of the surface have been greatly warped (*tourmentées*) and displaced; they are, therefore, even in the same district, far from occupying the same level, and from being regularly met with at the same depths; nevertheless, in this disorder, great as it doubtless is, the law of super-position which we have noticed does not cease to exist.

XXVI. Marl and lime are powerful agents of fertility in this kind of soil; but for both, and particularly for lime, it is necessary that the soil should be drained, or they must be applied to it in quantities resembling those of the English. With this condition of the soils being invigorated [by draining,] these two agents have already changed the face of extensive districts, which have been doubled by their means in wealth and population. An age ago, Norfolk, now a county of classic agriculture, was covered with heath; it is marl which has rendered it capable of bearing that succession of crops which makes it rival the most favored soils in fertiliy. One-third perhaps of the cultivated soil of England and Scotland has received, and still continues to receive, from lime, an impulse of fertility which raises the mean product of their fields to, at least, a half more than the same soil produces in France. Marl and lime, in Germany, have changed the aspect of whole provinces. Italy, by lime, has improved the culture of large wet *plateaux*. America renews by lime the exhausted fertility of vast plains, from which cultivation had demanded too much without returning to them a sufficiency of manure.

In France, La Puisaye in Yonne, has been trebled in value by marl: half the territory of the Department of the North owes its classic cultivation to marl and lime; many cantons of Normandy, the *Arrondissement* of Bernay, the environs of Lisieux, seek for marl at a depth of 200 feet; and finally in Sologne the use of marl has already improved great extents, but unfortunately it is more rarely found there than in other places.

Lime in the three Departments of Normandy has produced effects more numerous, more extended, but yet more recent than marl; a mine of coal (*houille*) of middling quality, worked during the last few years, there furnishes fuel for a great number of lime-kilns, three-fourths of the product of which are employed in agriculture. La Sarthe, Maine-et-Loire, which have employed lime for less than forty years, see their agriculture enriched in proportion as its use is extended.

The Department of Landes, with its barren sands, is covered with harvests by the application of lime to its soil: there is not perhaps an argilo-silicious plateau, in France, on which trials of marl and lime have not been made with success. We are far, it is true, from a commencement of experiments in their use on a large scale, but it is already a great point to have begun.

Nevertheless, as it appears, scarcely a fourth part of the argilo-silicious soil can have been improved by either of the means; if they were extended to the other three-fourths, it is not believed that there is any exaggeration in saying that there might result an increase of an eighth in the whole production of the French territory; an immense result, doubtless, and which would not be the only one; for a multitude of observations and arguments, as well as the actual healthiness of the lands where lime and marl have been largely used, should induce a belief that on this soil, improved by the calcareous principle, the salubrity which it wants would re-appear with the fertility.

XXVII. When marl and lime are wanting, or are at too great a distance, or too dear, their place may be supplied, and, on this soil which requires to be stimulated, an impulse of fertility may be given analogous to that produced by the calcareous agents. Paring and burning is a resource always certain for these soils; there is then a production of lime in the calcined vegetable particles. The vegetable powers produce potash and lime even in soils which appear to contain none; paring and burning brings into play these active principles of vegetation, which although in small proportions, exercise all their influence on the soil; and moreover the clay undergoes a modification which seems to produce upon the soil an effect similar to that of lime, and, like it, to develope, in a high degree, the faculty of imbibing from the atmosphere the elements of the growing plants.

ANALYSES AND QUALITIES OF MAGNESIAN SOILS.

By M. Puvis.

Translated for the Farmers' Register, from the *Annales de l'Agriculture Francaise.*

[The following extract is taken from the *Excursion Agnonomique en Gatinais*, of M. Puvis, his publication which next succeeded the foregoing article, and part of which is suited to follow in connexion. We shall present such parts as may throw light on the other communications of this writer, or otherwise, may seem likely to furnish agricultural instruction..

This part is selected as presenting specimens of a new class of soils, those containing magnesia—and to which ingredient, the author attributes their sterility. The facts presented are novel, (at least to us,) and also interesting: but the author's deductions from these facts, we dissent from altogether. Our views, in contradiction to our author's, will be postponed until his opinions have been presented.]

Plateau of Gatinais.

At some distance from Paris, when we leave the valley of the Seine, after having ascended a hill of considerable elevation, we find on the summit the silicio-argillaceous plateau; a great part of the forest of Fontainebleau is situated upon it, as is that of Montargis; this plateau separates the basin of the Yonne from that of the Seine. Silex prevails there in the state of sand; these sands serve as materials for the brown free-stones (*aux grès á cement calcaire et á cement siliceux,*) which are met with in only one part of the plateau; but when the free-stone is wanting, there is always found a great number of flints, which by their form and covering greatly resemble those belonging to chalk, which are found so abundantly in the basin of the Seine as far as the coasts of the sea. Chalk is found on the surface in many places below Paris; but above, it is most frequently covered with many other strata which keep it from the surface; and nevertheless, flints are very numerous in the soil of the plateau. In the same manner, in those of Dombes and Bresse we find the rolled pebbles of the Rhone, so numerous in all the formations of the basin; so the argilo-silicious plateaux almost always contain fragments peculiar to the formation of the basins which they overlook.

The fragments of the lower parts of the basin which are found in the argilo-siliceous alluvion of the plateau, would prove, if that had not been already established, that this formation is the most recent, that it was general, and that it took its elements even from the bottoms of the basin, and that it covered these bottoms as well as the high plains, or ridge land.

The Estate of Barres.

At some leagues from Montargis, beyond Nogent, we reach Barres, the property of M. Vilmorin.

This property, which he purchased thirteen years ago, contains 600 *hectares* (1,200 arpents.) His agricultural experiments, his desire to undertake great improvements, were too much confined in the neighborhood of Paris. To be successful on a soil of good quality, was not enough for his activity and his desire to be useful; he therefore made a purchase here on a soil of little fertility, and in his hands, this property has become quite an experimental farm. It could not have been better chosen for this purpose, because the land is composed of the two kinds of soil which form the district.

The property is divided into two parts by a small valley, containing 50 arpents of pasture, meadow and marsh, which are divided between the two domains; the eastern part belongs to the calcareous plain which unites with the calcareous plains of Yonne, without, however, being of the same nature as they: it composes two thirds of the property, that is, 800 arpents. The western part, which is more elevated than the eastern, belongs to the argilo-silicious plateau of the Gatinais; of the 350[*] arpents which compose it, 150 are sloping, and form the passage from the plateau to the valley. These 150 arpents partake of the two natures of soil; they are of good quality. The remainder, 200 arpents, belong entirely to the plateau, and are composed of sandy sub-soil mixed with angular flints of chalk.

This property offers greater resources in forage than most of the neighboring estates: besides the meadows of the valley, just spoken of, it has some of considerable extent on the Vernisson, a brook which waters the country.

I. The calcareous soil of the plain rests sometimes on a white, granulated marl, which is easily crumbled, and sometimes on a hard rock, which resists the atmospheric influences; it seems to make an exception among those of its class and appearance; its exterior characters would cause it to be esteemed fertile in a great part of its extent; it shows a sufficient stiffness, a dark color which announces a sufficiently strong proportion of mould, and often even the chestnut color, the ordinary indication of a good soil.

It is especially in spring crops that this soil shows its inferiority; oats, barley, and spring vetches come up well enough after sowing, but they are without strength at the time of heading. Clover, lucerne, and sainfoin, take well when sown in the spring; at harvest, the cereal plants cover them; they are vigorous enough, and preserve a good appearance even during autumn and winter; but when the time for shooting arrives, they put up only a small number of stalks.

When this soil remains uncultivated, it is badly covered with turf, produces thistles, euphorbia, and other plants of no use or advantage to the cattle that run upon it. It suffers from wetness. Sheep upon it take the rot; but it suffers still more from drought, which seems to render the stalks of plants stationary upon the soil.

II. The calcareous plateau of which we speak here is very extensive: it reaches from Montargis to beyond Barres, more than 10 leagues in length.

This kind of soil appears to be peculiar to this part of the basin of the Seine; the neighboring calcareous soils which appertain to the basin of the Yonne, present entirely different characteristics; they are dry, it is true, but with a vegetable stratum, they become covered with wild leguminous plants, easily produce clovers, sainfoin, lucerne, and in wet springs, spring crops succeed upon them.

These soils have then something peculiar in their nature which makes them a troublesome exception in the class to which by their composition they naturally belong: they present an agricultural question of great importance to study, and almost new, and they are applicable to sufficiently great extents of soil, since they occupy more than ten leagues in length.

The analyses made of them by M. Henry, at the request of M. Vilmorin, are very interesting, and are as follows:

No. 1. A coarse gray land, the earth of the surface composing at least three fourths of the ploughed soil of the plain.

10 *grammes* of this earth gave:

Silex, - - - - - -	2.45
Alumine, - - - - -	0.35
Carbonate of lime, - - - -	3.85
Sub-carbonate of magnesia, -	0.23
Per oxide of iron, - - - -	0.41
Humus, { Soluble, 0.12 Insoluble, 1.70 } -	1.82
Water, - - - - -	0.58
Loss, - - - - - -	0.31
	10.00

The 18 per cent of *humus*, soluble and insoluble, which this analysis gave, may cause a suspicion that the sample furnished contained more of it than an average of the soil. The proportion of *humus* would be quite extraordinary, since lands the most fertile contain scarcely 10 per cent: and there are hardly any except marsh or alluvial lands which contain it in that proportion; it is nevertheless established by this analysis that this soil contains a great proportion of *humus*, especially of insoluble *humus*.

No. 2. Represents nearly a fourth part of the extent—the portions where the vegetable stratum is very thin, where it is not ploughed on account of its deficiency in fertility, and is used as a sheep pasture,

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[*] In the original, this is misprinted as 250.—Tr.

10 *Grammes* gave:

Silex	1.80
Alumina	0.20
Carbonate of lime	6.90
Sub-carbonate of magnesia	0.47
Oxide of iron	0.27
*Oxide de magnesie** [manganese?] a trace	0.00
Water	0.20
Humus, soluble	0.05
Loss, and charcoal of insoluble humus	0.11
	10.00

This earth, the least fertile of all those analyzed, contains twice as much carbonate of lime and of magnesia as the former; the color also is whiter. It appears to receive its change of color from the *detritus* (or broken down fragments) of the friable rock on which it is based; its composition is almost identical with that of the sub-soil No. 4, of which we shall give the analysis below.

No. 3. Sandy earth of the calcareous plain belonging to those portions of the plain, which, in the revolution that carried off the silicio-argilaceous stratum, preserved a part of it now mixed with the soil of the plain.

10 grammes of this earth contain:

Silex	7.90
Alumine	0.67
Sub-carbonate of lime (represented by *chlorure*, 0.18)	0.16
Sub-carbonate of magnesia	0.02
Oxide of iron	0.47
*Oxide de magnesie** [manganese?]	0.03
Humus, soluble	0.15
Water	0.35
Loss and charcoal of insoluble Humus	0.25
	10.00

This earth presents a great difference in composition from the preceding, since it contains 80 per cent of silex and scarcely 16 thousandths of carbonate of lime, and 2 thousandths of carbonate of magnesia. Yet its properties, its productions and its defects, are nearly the same as those of the preceding numbers. On the other hand, it would seem by its composition to be almost confounded with the sandy sub-soils of the plateau lying on the other side of the valley; but it produces neither heath, broom, nor sheep sorrel, &c.; plants characterizing these sands—and it agrees, as to cultivation; with Nos. 1, and 2, and like them, spontaneously produces euphorblia, thistles and other plants useless to cattle. It possesses then those common properties of an active agent which must be common to both, which makes them a distinct class; and this agent can be nothing else than the mixture, or perhaps combination of the carbonates of lime and magnesia.

These two principles, therefore, have a very great effect upon vegetation, since 16 thousandths of carbonate of lime joined to 2 thousandths of carbonate of magnesia are sufficient to change entirely the nature and products of the soil. But let us pursue our analyses before making a deduction of all their consequences.

No. 4. Sub-soil of the plain. Its color is reddish, as is that of many calcareous soils of good quality; but having been neither affected nor modified by the waters of the last revolution, in consequence of the shelter given it by the upper stratum; and not having been exposed to the atmospheric influences, it may be regarded as the type of the deposite which forms the soil of the plain, the deposite anterior to the silicio-argilaceous formation.

10 Grammes of the sub-soil of the plain gave:

Silex	0.39
Alumine	1.27
Carbonate of lime (represented by *chlorure*, 8.20)	7.41
Carbonate of magnesia	0.41
Oxide of iron	0.31
Oxide of magnesia	0.00
Water	0.06
Humus, soluble	0.05
Loss	0.10
	10.00

This soil is a species of marl which contains 74 per cent of carbonate of lime, 4 of magnesia and 12 per cent of alumine: its composition is quite similar to that of the analysed soils of the plain.

III. These analyses may afford us important inferences.

These soils evidently make, as we have seen, a distinct class of the silicious soils. Their properties seem to differ at least as much from those of calcareous soils, properly so called, which produced spontaneously the small species of clover, on which leguminous plants of different species succeed easily, and manures almost always secure good crops. It is not then to the carbonate of lime that they owe their inferiority: its action, on the contrary seems, to be nullified, since the characteristic properties of calcareous soils appear no longer to exist in these. Nor is it more to the silex, the alumine, nor the oxide of iron, which are found in abundance in all good soils, that this difference can be attributed. Then, of all their constituents, there remains only the magnesia to which can be owing the characters which distinguish them from their analogous soils.

It has been already fully admitted in principle that magnesia is unfavorable to vegetation. The English chemist Tennant formed this conclusion from the analysis of a lime which struck with sterility all the soils to which it was applied. In America the use of a magnesian lime quickly wore out (*fatigué*) the soil; and Davy has admitted it as a truth. Some trials on a small scale have shown me that while in a calcareous soil, beans, when sown, sprouted soon, and came up vigorously, in the same soil modified by an addition of magnesia, germination was retardeded, and the stalks especially had only a feeble and tardy growth: Yet Thaër call into question the soil being made steril by magnesia; and opposes to the conclusions of Tennant, that Einhoff has analyzed a very fertilizing marl which contained 20 per cent of magnesia: and farther, it results from a careful analysis, that the mud of the Nile, which we know to be so fertile, contains a large proportion of magnesia. From these last facts it may be concluded that the magnesian mixture in the soil may indeed, under certain conditions yet unknown, not be injurious to fertility: but there still remain multiplied facts, and the results of observations, of which our whole plain presents us with a new and great example, that many magnesian soils are unproductive.

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* So in the original.—Ed.

But how does magnesia occasion barrenness in a soil? This problem is doubtless of difficult solution, but very important, since it seems probable that if we knew the causes which render magnesia unproductive, it would perhaps be possible to remedy them; we shall attempt to point out some *data* which perhaps may indicate the course.

And first we will remark that the magnesian mixture takes from the soil all its characteristics of calcareous soil, deprives it of all the advantages which always accompany the unadulterated mixture of the calcareous principle, and gives it a character peculiar to itself, which distinguishes it whether by its mode of acting on vegetation, or by the vegetables which it spontaneously produces, to the exclusion of those produced by the calcareous soil.

Still farther, it would seem, that magnesia takes from the carbonate of lime the property which eminently distinguishes lime and all its compounds; that of rendering *humus* soluble, and that it tends on the contrary to render *humus* insoluble, in proportion as it is accumulated in the soil by cultivation. In fact, the great proportion of insoluble *humus*, which the analyses have found in the soil which composes three-fourths of the cultivated plain, although a part might have been owing to an accident, could not proceed from spontaneous vegetation in this soil which is almost always under the plough, and which produces few plants. It proceeds then from cultivation: but cultivation does not furnish insoluble *humus;* the *humus* of the manures, then, have passed into this state in the soil. Now, it is not the lime, the action of which consists in rendering *humus* soluble, that can have produced a contrary effect; neither is it the silex nor alumine to which it is attributable; it must therefore be charged to the magnesia alone, and to this circumstance we may ascribe the unproductiveness of magnesian soils, in which manures, instead of benefiting the plants cultivated on the soil, pass into the state of insoluble *humus.*

The carbonate of magnesia has, besides, the property of retaining more water than all the other earthy combinations. According to the experiments of Schubler of Hoffwyl, it receives and retains four and a half times its weight. It may be possible that it communicates to the soil in which it is found, the property of retaining a quantity of water, which at first would be injurious to vegetation. This would explain the cause of the rot among sheep on this soil; but this water, after having injured vegetation, would not continue in the soil, for it suffers much from drought in the spring.

In this state of affairs, and in a question so important, on which doubts are accumulated, and facts and opinions are arrayed in opposition, it is a great and noble agricultural problem, that the proprietor has proposed for himself to subdue this rebellious soil and force it to yield good crops; we shall see hereafter that this object has been, in a great measure, obtained.

IV. After this long discussion on the magnesian soil of the plain, we come to the soil of the *plateau:* this kind of soil composes a great part of the *arrondissement* of Montargis, especially in the south and south-east portion; it covers besides almost the whole extent of the *arrondissement* of Gien on this side and beyond the Loire. This soil has received the name of *terre de Sologne;* the only differences which characterize the parts sloping towards the Seine and those which slope to the Loire, are the chalk flints in the basin of the Seine and the fragments of different varieties of silicious rocks in the portion of the *plateau* which slopes to the Loire.

The soil of the *plateau* of Barres offers every where a pure clayey sand, which contains in great quantity the chalk flints of the basin of the Seine, and varies little. Yet it is dry or wet according to the sub-soil on which it rests; when it is based immediately on the calcareous rock of the plain it is dry; and it becomes wet when its sub-soil is the reddish silicio-argilaceous stratum which does not allow the water to pass through, and consequently preserves the moisture of the surface.

This soil, compared to that of the plain, is not of difficult cultivation. Rye, potatoes, and buckwheat, grow well enough upon it; with manures, artificial meadows succeed; and trees of every kind, leafy *(feuillus)* and resinous, shoot up vigorously. On the whole, this portion of soil which touches the calcareous *plateau,* on which besides it rests, is superior in quality to the parts of the *plateau* which are more distant from it. It is even of more easy cultivation, and offers especially more resources than the magnesian soil; nevertheless, it contains no calcareous parts, heath, broom, and wild sorrel, which every calcareous mixture puts to flight, are met with on this soil in all parts of the 200 arpents of it which are left untilled.

V. The rest of the soil, under the plough, of which the property is composed, presents a gentle slope, on which the owner's house is situated. This slope forms the passage from the *plateau* to the plain, going along the valley; it offers 150 arpents of pretty good soil, suitable for all productions, for wheat, artificial grasses, trees, and especially for oaks; this soil is due to a mixture of the soil of the *plateau* and of the plain, but the mixture is not uniform.

VI. Lastly, it remains for us to speak of the little valley which separates the two parts of the property.

This narrow valley receives the waters of the plain and the *plateau;* it contains a great number of springs, which are doubtless the filtered waters of the two *plateaux* which have no visible springs. It is very remarkable that the springs come almost all of them from the side of the calcareous plain, the silicio-argilaceous plateau with its *impermeable* sub-soil, has scarcely admitted any filtration, so its side furnishes few or no springs in the valley.

A great part of the bottom of the basin is marshy, requires draining and seems to us very susceptible of being drained; one part is in pretty good pasture, another in tolerable meadows, and the rest in marsh, which is mown for litter.

The calcareous rock shows itself from time to time at the bottom of the valley. The upper stratum of the soil, belongs rather to the magnesian soil of the plain than to the silicious soil of the *plateau.* It is firm in all the parts which the interior waters have not diluted. Works judiciously made in the marsh have commenced its draining, the results obtained and a sufficiently great slope, promise, as we shall see hereafter, success to the undertaking. Vegetation in this valley is active, the trees are fine, and if the magnesian principle, as is probable, occurs there, it does not seem to injure vegetation; in this inundated soil, some principles probably exist which neutralize the destructive effect of the magnesia. * * *

REMARKS.

It seems a singular and illegitimate conclusion of the author, that the sterility of the soil of "the plain" is caused by the small quantity of carbonate of magnesia contained. It would have been much more plausible, if the very large proportion of carbonate of lime contained had been considered as the true evil. The soils giving the analyses 1 and 2, are stated to be specimens of the whole calcareous and magnesian plain—and No. 4 shows the sub-soil common to both, and to the whole plain. In these two varieties of the same general kind of soil, the proportion of carbonate of lime is 38 per cent. in the first, and in the second, 69 per cent.—and the sub-soil of both, (No. 4,) has 74 per cent. Surely these large proportions of carbonate of lime, are sufficient to account for sterility, after the continuance of exhausting and bad tillage for time immemorial, without looking for that cause in the presence of carbonate of magnesia, which these same three specimens contain respectively in the very small proportions of 23, 47, and 41 thousandths—or less than the half of 1 per cent. We do not believe that this earth (in much larger proportions,) is injurious to soils but infer the reverse, from the great similarity of its chemical qualities to those of carbonate of lime—and from some of the richest soils in the world containing carbonate of magnesia. Thus M. Puvis himself states that it is in the soil of the rich valley of the Nile—and we have found it in the celebrated alluvial soil of the Red River. The authorities brought to sustain the position that the magnesian ingredient is injurious to fertility, if examined, are worth as little as the reasoning. Tennant, it is true, attributes injurious effects to the magnesia contained in certain limestones; but it is to magnesia brought to its *caustic state*, by the burning of the limestone, and so applied to the soil. This may well be the case, and all the injurious effects of such manure, referred to by our author, may be true, and yet the mild *carbonate of magnesia*, as it exists naturally in soil, may be either harmless or beneficial. Still less does Davy's view sustain this opinion of M. Puvis. That great agricultural chemist quotes Tennant's discovery and statement, but without seeming to concur entirely in the asserted ill effects of even caustic magnesia—and he certainly contradicts the notion that a natural and small proportion of the carbonate is injurious, by referring to the valuable qualities of the Lizard Downs, which have that rare ingredient.

But putting aside M. Puvis' deductions, the facts as to the presence of magnesia, and the prodigious amount of calcareous earth in this poor plain, are sufficiently worth attention. We cannot, however, presume to reason with regard to facts which are so concisely and imperfectly presented, or to explain away difficulties which oppose any general and uniform deduction. But we will venture to hint our opinion, that these highly calcareous plains of France, were at some far remote period immensely rich *prairies* like those of Alabama and Arkansas: and that the latter, if exposed to a similar long course of exhausting tillage, will hereafter be as poor, and as difficult to be improved, as these calcareous plains of France, or the chalk *downs* of England.

From the Arcana of Science.

PRICKLY COMFREY—A NEW SPECIES OF FOOD FOR CATTTE

Symphytum Asperrimum, a hardy perennial of gigantic growth, introduced from Caucasus, as an ornamental plant in 1801, by Messrs. Loddiges, of Hackney, as specified in Curtis's *Botanical Magazine*, where it is figured, No. 929. Horses, cows, sheep, pigs, and geese may be fed with it; and as it is of wonderful growth, and, may be cut successively from April to October, it may be cultivated to great advantage. For horses, to be put in the racks, spread on pastures, or the green stalks to be cut with chaff, it will be found most useful. Two out of three will take it at once, the others will soon follow, and when once the taste is acquired, they will never leave it. Cows do not take it at first so freely as the horse, but soon take it, and are eager for it. For sheep or lambs it is very good; they will take it freely, the latter before they are a month old. It is a very early plant, and immediately follows the turnips. The first crop of leaves to be fed off before the flowering stalks rise, care being taken not to feed too hard, so as to damage the crowns of the plants. Spread on pastures, put in racks or folds on fallows, it will be found of great service. For pigs it is very useful; they eat it freely and do well. Geese will eat it, as soon as hatched. It will grow in all soils and situations, superior to any other plant, and may be planted by the sides of ditches, in any waste corner, fields, orchards, gardens, &c., where only useless rubbish grows. The only expense is, the purchase of a few in the first instance, as it may be increased to any quantity, and, once established, will last for ever. I know some that have stood more than twenty years, and are as full of vigor as they have ever been. It is now ready for cutting (March 31st). I have cut it when more than seven feet high, and as thick as it could stand on the ground. I once cut and weighed one square rood; the average was seventeen tons, three cwt. per acre. I have no doubt but that in the course of the year the produce would have been thirty tons. I cannot say what effect continual cutting may have on this plant, or on the land, for many years together; but as far as I have experienced, it does not weaken the plant. I have cut it three times in one year, and found it equally strong the following spring. The proper distance for planting it is from two to five feet square, according to the quality of the land. It may be planted at any time of the year, but, like other herbaceous plants, is best when in a growing state.—See a letter to Lord Farnborough, signed Dr. Grant, in the *Northampton Herald and General Advertiser*, Saturday, October 10, 1835.

From the Baltimore American.

CULTURE OF THE TEA PLANT IN OHIO.

The geographical position of China and the United States is similar, both being situated on the eastern side of their respective continents, and lying between nearly the same latitudes.—Hence there is, it is said, great resemblance and correspondence between them in climate. Our attention is called to these circumstances at the present moment by seeing the annexed account of the successful culture of the tea plant in this country. The plant flourishes in China as high north as the fortieth degree of latitude, although the other kinds grow in the more southern provinces of China. Unsuccessful attempts have been made in various parts of the world to rear the tea plant, but this we believe is the first in our own country. We see no cause why the plant should not flourish in this climate, and a knowledge of the art of curing it can be easily attained.

"Mr. John Platt of Marietta, Ohio, advertises in a paper of that place, that he has succeeded in cultivating the genuine Tea Plant of China. He has, he says, raised the plant for ten years past at Marietta, and after a series of expensive experiments has been fully successful in discovering the art of drying and manufacturing the leaves into tea of a quality quite equal to imported Young Hyson. He offers gratuitously to furnish fresh seed of the last year's growth to any gentleman desirous of pursuing the cultivation."

From the Dublin Journal of Med. and Chem. Science.

PRESERVATION OF LEECHES.

A. Voget, in a notice inserted in the *Pharmaceutische Zeitung*, observes, that he has been in the habit of adding a small quantity of powdered crab's eyes, to the water in which he keeps leeches. This powder of course sinks, forming in the bottom of the vessel a thin stratum, in which the leeches seem to take the greatest pleasure, creeping about on it, and thus cleansing the surface of their skins, and getting rid of the mucous threads and flocculi, with which they soon become encumbered, when in a state of captivity.

Cavaillon, Chevallier, and Moreau ,de Jones, have all borne witness to the good effect of mixing *charcoal* with the water in which leeches are transported from one distant place to another. In cases where it is necessary to carry them during a long sea voyage, the inside of the vessel should be well *charred*, and some very finely powdered charcoal should be added to the water. Cavaillon prefers for this purpose *animal charcoal*, as it possesses much stronger antiseptic powers than the vegetable. It was by means of charring the casks and adding some charcoal to the water, that the French succeeded in conveying, in health and vigor, a considerable number of the fish called gorana, from the isle of Bourbon to Martinique.

Doctor Kluge, of the Charite, in Berlin, made some interesting experiments, on the best means of preserving leeches.—From his researches, Dr. Heyfelder has been led to recommend a mixture of three parts of rectified spirits, four parts wine vinegar, and twenty-four parts water. The leeches are to be placed in this mixture, and are to be left in it a little less than five minutes, after which they are to be washed with fresh river water, and to be put into a vessel for keeping. Leeches that have been used are likewise served in this manner.

From Jameson's Journal.

RESISTANCE ON RAIL ROADS.

At the late meeting of the British Association, Dr. Lardner made the following observations on rail roads. He stated that every road offers a sensible resistance to traction, but this on a rail road is less, because the surface is more uniform. The resistance on a rail road to the power of traction is always the same, as the resistence produced by ascending an acclivity, rising one foot in 250; that is, supposing the rail road to be level. Suppose a rail road rising 1 foot in 250, resistance to traction then proceeds from two causes,—the resistance on the level, as already explained, and the resistance offered from the actual declivity. The resistance to be overcome on the level is equivalent to nine pounds per ton; and on the road ascending 1 foot in 250, it would be eighteen pounds per ton; and thus it is seen that, in the latter case, the drawing power must exert twice the force necessary on the level. If the road rose 2 feet in 250, the drawing force would be twenty-seven pounds to the ton. This view of the subject is confined to ascents, but it should not be forgotten, that when a rail road is worked, the transit is from one end to the other. It is necessary, in estimating the merits of rail roads, to consider their action downwards as well as upwards. In coming down a steep no force is required to impel an engine, and the gravity restores that force in going down which it has robbed from it in the ascent. You have to provide in an ascent of 1 foot in 250, for a resistanee of eighteen pounds to a ton, but in descending, no force is required. If it was desired, to strike an average between the ascent and descent, the road would present a surface which would be equivalent to a level. This point, respecting ascent and descent, struck the House of Lords, before which he gave his opinion, as a paradox, but it was one only in sound and not in reality. Dr. Lardner remarked, that these observations referred to ascents not more steep than 1 foot in 250; but supposing the rise to be 3 feet in 250, and where the strain would be, consequently, thirty-six pounds in each ton, would gravity give this back in the descent? It was true that no power was required in descending, but while only nine pounds were gained in the descent, twenty-seven pounds were lost in the ascent. Besides, the loss of power, there was also the danger resulting from the too great velocity occasioned by sudden descents. In one of the lines of rail way, for which a bill had been applied to the House of Lords, there was a slope of 1 foot in 106, in a descent of two miles and a half, and the velocity given to an engine on arriving at the foot of the slope could not amount to less than seventy miles an hour. To mitigate defects arising from these abrupt descents, breaks were applied, but not always with success. The break is a piece of wood, pressed against the tire of the wheel by a level, and if it acts with full effect it ought to prevent acceleration. He had seen several cases in which it had totally failed, and one instance which occured, he would detail. At one of the slopes between Manchester and Liverpool, he was descending with a loaded train of 150 tons. The operative engineer, whether through a desire of displaying the engine's movements, or through neglect, forgot to apply the break at the commencement of the slope; when half-way down, the velocity became so great, that he requested the breaks to be applied, but on doing so, they were instantly burned. The train went down at a tremendous speed, although the supply of steam had been cut off. When the train had been stopped, it was found that the wheels of one of the wagons which revolved with the axis, had been broken, and yet, notwithstanding this accidental drag, the speed amounted to at least fifty miles. It was objectionable to have any slope exceeding 1 in 250, for when the excessive natural powers of gravitation were resorted to, control over its movements was impossible. The conclusion to be arrived at, although it appears paradoxical, is, that you may construct two rail roads, say of 100 miles in length, one level, the other going over mountains, and yet the two rail roads may be worked by the same mechanical power. Suppose in the one you ascend 1 in 250, and descend in the same ratio, a pull of eighteen pounds to the ton is required only fifty miles, and on the other half you descend by inertion. On the level road, a pull of nine pounds to the ton is required, from the entire distance of miles, and thus the extent of exertion is equalized. It was not, however; to be forgotten, that they should have a regard to the power used. If the power to be used was that of animals, then it might happen that the hilly road would be better than the level; for nothing was better understood than that a dead and unvarying pull upon the same set of muscles, would have the effect of causing the labour to be more severe, while a varying pull would alternately give quiescence and exercise to the muscles. If the line was so disposed as to throw the whole ascent in one spot, the advantage would be gained of having the rest of the road nearly level. But the cost of attaining this advantage should not be forgotten. Steeps of this description required an increased power, and the engines capable of working on the general line of road would not be capable of exerting an increased force. There were only two ways of ascending sudden ascents, one by the agency of an additional engine, and the other by having the whole train pulled up by means of a rope. The additional engine would occasion much additional expense, for the supply of them would always be preserved, and the men should be paid their wages whether wanted or not. The use of the rope would occasion an enormous waste of power; and he mentioned the instance of a place, where on ascent of 1 foot in 106 occurred. The rope was five miles long, and its weight was 60,000 pounds. Dr. Lardner next referred to one point on which he seemed to consider that engines generally were at variance with what was correct. He contended, that the heat of the fire is directly proportional to the quantity of the steam allowed to escape in a definite time into the flue, and consequently that half the number of blasts of steam projected into the chimney in an engine going up a hill, would have the same effect in exciting the fire as double the number of blasts of half the condensation, when the engine was running on a level plane.

From the Baltimore American.

TRADE OF THE UNITED STATES

The annual statement of the Commerce and Navigation of the United States for the year ending 30th September, 1835, lately laid before Congress, presents the following general results. They are derived from that document by the Washington correspondent of the New York Journal of Commerce.

The imports during the year, (ending 30th Sept. last,) amounted, in value, to $149,895,742, of which there was imported in American vessels $135,288,865, and in foreign vessels $14,606,877. The exports during the same year amounted to $121,693,577, of which $101,189,082 were of domestic, and $20,504,495 of foreign articles. Of the domestic articles, $79,022,746 were exported in American vessels, and $22,166,336 in foreign vessels. Of the foreign articles, $15,112,445 were exported in American vessels, and $5,392,050 in foreign vessels. Of American shipping 1,352,653 tons entered, and 1,400,517 cleared from the ports of the United States. Of foreign shipping 641,310 tons entered, and 630,824 cleared.

The greatest imports in any previous year, were in 1816, at the close of the war, when they amounted to $147,103,000—being $2,792,742 less than last year: and the greatest exports in 1807, when they amounted to $108,843,150, or $12,850,427 less than last year. Of the exports in 1807, only $48,699,592 consisted of domestic articles, whereas last year the domestic exports amounted to $101,189,082. [The year in every case unless otherwise specified, ends 30th of September.] In 1834 the imports amounted to $126,521,332, being $23,374,410 less than in 1835; and the domestic exports to $81,024,162 or $20,164,920 less than 1835.

The tonnage which entered the ports of the United States in the year ending 30th Sept. 1835, was 1,993,963 tons, as stated above, being a greater amount by 351,241 than entered during the previous year. Of this increase, 277,983 tons were American shipping, and 73,258 tons foreign shipping. Showing a comparative gain in favor of American. The same remarks, with some slight variations, are applicable to clearances.

The statement of actual tonnage owned in the United States, indicates a corresponding increase. The returns for the year ending December 1834, show a greater amount than in any former year.

From the New England Farmer.

PREMIUM ON DRAINING AND CULTIVATING SWAMPY LAND.

At the late annual meeting of the Agricultural Society, Mr. William Clark, Jr. of Northampton, presented his claim, and obtained the Society's highest premium, offered "on the greatest quantity of land reclaimed and crops therefrom, accompanied with a written description of the management, condition and worth of the land, before and since reclaimed." The Executive Committee have the privilege of presenting a detailed account thereof, and would be very happy for the opportunity of exhibiting many other similar experiments made by our enterprising farmers. Mr. Clark also obtained the Society's highest premium for the greatest quantity of Indian corn raised the past year upon another tract of land.

To the Executive Committee of the Hampshire, Hampden and Franklin Agricultural Society:

Gentlemen—In the spring of 1834, I commenced ploughing for a crop of corn, a field of about fourteen acres. In various parts of the field were swales, wet, springy places and swamp holes, some parts of which were covered with water most of the season, some with moss and small bushes, and others with sedge and course grass, amounting in all to four or five acres. The best part of this wet land was mown in 1833, and gave of poor hay but little more than enough to pay the expense of gathering; the remainder was entirely unproductive and probably ever had been.

As it was desirable that these places should be something more than mere nuisances, and if possible, the whole field wear the appearance of civilization, it became a question for consideration, whether it could be done in such a manner as that the produce would pay the expense. After a careful view of the ground, it was thought that the plough would be the readiest and least expensive instrument for draining off the water as well as subduing the wild grass and shrubs.

A long swale running nearly through the lot with a moderate descent, gave a good opportunity to drain with the plough, not only the water that was oozing out over its surface, but also that from the springs and wet lands on either side.

The largest basin, or swamp hole, amounting to about half an acre, including the belt of small bushes and balk around it, and situated near the highest part of the lot, was laid dry by an under or covered drain of about six rods in length, cut through the rim of the basin, previous to ploughing; the other parts were drained of the surface water without the use of the spade, by drawing the first furrow, when striking out the lands or ridges, at such places as would cut off the springs, and in such directions as would give sufficient fall to the water, and lead it into the main furrow in the long swale. Considerable care was necessary to strike out the ridges, so that when the ploughing was finished, the furrows should not only have a good descent, but lead off the water without further labor in opening communications from one to the other.

After the superabundance of water was thus taken off, and the ground became so solid that it could be ploughed, which was in a day or two, the whole was turned over; care being taken that none of the former growth should be left on the surface, but all turned under to the depth of five or six inches; if possible, without bringing up much of the poor subsoil. And to drain the ground yet more perfectly after it was ploughed, the furrows were deepened by running the plough through them a second time, and the loose earth hauled out upon the ridges. After it became sufficiently dry to work, it was rolled, and about 20 cart buck loads to the acre of horse manure, was spread from the cart over the surface and harrowed in.

The other parts of the field having been treated in the same manner, except the draining, the whole was planted with corn, in rows without regard to furrows or drains, except not planting in them. When harrowing the corn, particular care was taken not to disturb the sod, and at each time of hoeing the ground was kept as level as possible, except the water furrows or drains were cleared of the earth that the harrow in crossing them had hauled in, and a free passage for the water at all times maintained. At the last time of hoeing, the whole field was sown with grass seed, and also with about half a bushel of plaster to the acre. The whole crop of corn, as ascertained by the admeasurement of the ears, was about thirty bushels of shelled corn per acre, and had probably suffered a diminution of about twenty-five per cent. from the severity of the drought at the time the corn was filling out.

In the wet, or those parts of the field more particularly under consideration, the crop of corn on an average was light, perhaps not over two thirds the average of the whole field, or twenty bushels to the acre, although in some places where the draining was the most perfect and took effect early in the season, it was very good.

The grass seed took well, and after the corn and stalks were cleared off, the field contrasted finely with its former appearance. The brown and sere plain, the mossy bog, and heathy knoll, were clothed in green. No cattle were allowed to go on it, nor was it fed at all, except a little by trespass.

In the spring of 1835, after the ground was settled so as not to poach, it was rolled to re-set the grass roots that might be partially thrown out by the frost, crush the corn stubs, and level for the scythe. Having a preference for early cut clover, it was mown in June, part of that on the reclaimed land having begun to lodge, although the field in general was backward, not in full bloom, and according to common usage, not ready to cut. The reclaimed land suffered the least from the drought, and gave an average of about one and a half tons to the acre, while that of the whole field was about one ton. The hay was a fair mixture of clover, herdsgrass and redtop.

Immediately after the first crop was off, half a bushel of plaster was sown to the acre. The second crop was principally clover, and the reclaimed land at this cutting also gave much the best grass, probably an average of not less than two tons to the acre. The average of the whole field was something over one and a half tons, as ascertained by the actual weight of about twenty tons sold from the field. One of your committee went over the ground and viewed the crop at the last cutting. It is impossible to state precisely the expense of removing the stone and stumps, and that of ploughing, cultivating, and gathering the crops of the reclaimed land, or the value of its products separately, as the labor was performed in connexion with that of the whole field, and no separate account was kept with any given part of it.

I will, however, submit the following estimate, as being in my opinion not far from correct, taking the average of the reclaimed land, or that part of the field which before gave no valuable product.

One acre swamp.

1834.	Dr.	1834.	Cr.
To clearing for		By 20 bu. at 75c	$15

plough,	$3 00	Stalks,	1
To ploughing,	3 00		
To 20 loads manure,	20 00		$16
To rolling, harrowing and clearing drains,	2 00		
To planting and cultivating corn,	6 00	1835.	
To seed corn, grass seed, and plaster,	2 50	By 3½ tons hay sold in the field at $10 per ton,	$35
To harvesting,	2 00		
			$51
	$38 50		48
1835.			
To rolling, clearing drains and plastering,	$1 50	Balance creditor,	$3
To cutting and making two crops hay at $4 the cut,	8 00		
	9 50		
	38 50		
	$48 00		

The profit, thus far, it it may be called a profit, is small, but that the land is as thoroughly subdued and well fitted for future profit, as it would have been, under the usual three years' siege of plough and drag, and at very much less expense, I think will not be questioned. From the most worthless and barren, it has become the most valuable and productive part of the field, and the crops in two years, to say the least, have paid the expense of the improvement. The crop the coming year, other things being equal, will undoubtedly be as profitable as that of the last year, and probably valuable crops will be taken with little more than the expense of gathering for several years to come. And when it becomes necessary to turn under the present sod, it can be done at much less than half the expense of the former operation.

Respectfully, your most obd't serv't,

WILLIAM CLARK, JR.

Northampton, March, 1836.

ON MIXING OTHER GRASSES WITH CLOVER, TO PREVENT ITS SALIVATING THE HORSES FED ON IT.

To the Editor of the Farmers' Register.

Perhaps the following hints on soiling horses with green clover, may be useful to "A Subscriber" in the last No. of the Register. That "clover has an inherent property which causes it sometimes to salivate," cannot be doubted; what that inherent property is, I am not sufficiently skilled in chemical knowledge to determine; but from experience, I am convinced its salivating property may be in a great measure if not altogether neutralized. Having had an opportunity when on the opposite shore of the Atlantic of seeing the practice of soiling with green clover, and the benefits resulting from it as practiced in Great Britain, where the majority of the farmers are in the constant habit of giving it to their working and other horses during the spring and summer months, not only without injury, but with great benefit to the teams so fed—from a very free and liberal use of green clover in that country, I never knew salivation caused to any serious extent, or for any length of time. In this country I have found, and I believe it is very generally admitted, that a very moderate use of green clover oftentimes bring on salivation to an alarming extent. What causes should operate to produce this difference in effect, I cannot probably satisfactorily explain. It is not improbable that a difference in climate might in some measure tend to produce a difference in effect; but from my own observations in the country above alluded to, (and under more than usually favorable circumstances for such observations,) and from my own experience in this country, I should almost unhesitatingly attribute our want of success in this mode of feeding or soiling our horses, to our nearly universal practice of giving clover to our teams in a pure or unmixed state, and too often immediately after being cut, and without the benefit of a partial curing. In Great Britain, it is generally considered that clover alone, either in a green or perfectly cured state, is an unhealthy article of food for horses; to remedy this, it is the common practice when clover is intended for green soiling or for hay, when sown to be mixed with a large proportion of the seeds of other less succulent grasses. For this purpose, the *lolium perenne*, or perennial rye-grass, is the grass generally, though not exclusively preferred, sown at the rate of about a bushel of grass seed to the gallon of clover seed. When intended for any length of time for pasture, different sorts of grasses are included in the mixture. The above named grass when in a green or growing state, contains nearly as much soluble or nutritive matter, and nearly double the quantity of insoluble matter or extract, that is contained in clover; and the probability is, that the greater quantity of the latter ingredient acts as a corrective to the salivating property of the clover. An instance occurred last season within my own knowledge, which goes far to support the above supposition. On a farm, where I had an opportunity of almost daily observation, it was found absolutely necessary to commence soiling the teams with green clover at a very early period of the season. The clover was pure or unmixed, and the consequence was, that the whole of the teams speedily became salivated to an alarming extent. Various supposed remedies were tried without any apparent good effect. After the horses got much reduced and had become extremely weak, they were, as a last recourse, turned out to pasture for an hour or two at night, on a piece of ground having a good cover of grass free from clover, partly mixed with timothy and tall meadow oat grass; and though in the meantime their racks were kept plentifully supplied with green clover, in two days salivation was entirely stopped. A wet spell shortly after occurred, when it was found inconvenient, or considered imprudent, to tend the horses for that spell after dark, and it was consequently for some nights discontinued, when salivation again returned, but was again immediately stopped on a return to pasture. A sprinkling of salt on green clover, is generally considered beneficial. Dry wheat straw (that which is sound and sweet,) freely mixed with clover used green for soiling, (such as in this section of country is generally used,) I have found attended with great benefit, and if properly attended to, would, in my opinion, founded on the present as well as former years' experience, fully counteract the salivating property of the clover.

As "A Subscriber" remarks, I have found horses tired of, and sometimes altogether refuse pure clover hay; but I never knew such to be the case when properly mixed with other grasses. When clover is sown for the sole purpose of improving the soil, probably sowing it unmixed may be best; but when intended either for soiling or for hay, much and decided advantage would be derived from a free mixture of other grasses.

In Great Britain, the term clover hay is applied to all hay sown, when so much mixed as to contain from one third to one half of its entire bulk of other grasses, and in many cases, even more.

N. L.

Form the Horticultural Register.

FACTS IN REGARD TO THE GERMINATION OF SEEDS.

* * * * At one of their meetings, Count Sternberg offered some information on the sprouting and growth of grains of wheat which had been found in the cases of Egyptian mummies. The first attempt to vivify the wheat by previous immersion in weak acid failed, owing, as it appeared, to great age having rendered the outside skin of the grain so tender, that the floury portion of the seed soon liquified; and water alone produced the same effect. The next trial was made by dipping the grains into oil, and then planting them pretty deep in the garden pots placed in a saucer partly filled with water; this was successful, and two plants were produced, one of which was placed in the open ground, the other received the protection of the greenhouse. Of course much curiosity was excited on the question of the species of wheat common in those early periods. The plant exposed in the open air was much injured by frost and hail, but late in the season produced a few ripe ears. That in the greenhouse flourished and produced several heads which underwent minute examination, and proved to be what is now called *Talavera Wheat*; its botanical character is *Triticum vulgare—spica laxa, mutica, alba, glabra.* It was incidentally mentioned that grains of Indian corn had been found in the tombs of some of the Incas of Peru, which had been brought to vegetate.

The conversation subsequently took a very interesting turn on the subject of the powers of vegetation of seeds, particularly of the grasses gathered in an unripe state. Dr. Kurr of Stuttgardt, stated that he had succeeded in sprouting seeds of wheat gathered immediately after the blossom was over.

Professor Mohl repeated the observation of De Candolle, that in these cases vegetation took place quicker, as the process of the return of the floury part of the seed into a saccharine state was thereby rendered unnecessary. To understand this observation, it is perhaps necessary to state, that previous to ripening, the seeds of most grasses are milky and sweetish; the act of ripening changes this milk into a farinaceous or floury substance, destitute of sweetness but fit for food. Just before the seeds which are committed to the earth, sprout, this farinaceous substance again becomes sweet, and it is probable that this saccharine juice is the first food of the young shoots. The operation of making malt for the brewer, is the action of producing this last change—the barley is soaked until it just sprouts, the farther vegetation is then stopped by a drying heat, the floury part of the grain becomes saccharine, and when steeped in hot water produces a sweet liquor which ferments, and is beer.

From Loudon's Gardeners' Magazine.

CRIMSON CLOVER—TRIFOLIUM INCARNATUM.

The cultivation of this plant is, we are glad to hear, spreading rapidly; and it is in some parts of the country very generally taking the place of tares, as it produces a much greater quantity of food, and does not require much more than a tenth of the labor bestowed in preparing the ground and sowing it. It also comes in a fortnight earlier.

From the Yankee Farmer.

THE MAGIC ONION.

It is sometimes called the Canada, sometimes the tree, or top onion. This is a singular plant, and deserves cultivation, not only for its domestic use, but also as an object of curiosity. All other plants raised in the garden are oviparous, or in other words, re-produce their species from seeds or eggs, but this alone is viviparous, and brings forth its young alive; in clusters of four or five, around the parent stalk. These continue to enlarge, until their weight brings them to the earth, where if not prevented, they take root, and the maternal stalk now becomes useless, dries off, and the next season, these in their turn become parents, and re-produce a numerous progeny.*

This species of onion is raised with less art than the other. If you would them in perfection, make your ground ready as for the other kind; then stretch a line ten inches from the alley, and with a small hoe make a furrow two inches deep; in the bottom of this place set the top bulbs, or infant onions, five or six inches apart with their points or heads uppermost; then fill up the drill with the hand or broad hoe. This done, remove the line back a foot, and in the same manner plant as many as you please. In setting out these bulbs, you should not place the large and small ones promiscuously together, but separate the large from the small, and plant them in different rows; for the largest will generally become breeders, this season, while the small one will enlarge and swell into beautiful onions, fit for any use in the kitchen.

The magic onions intended for seed, or breeders, should be two years old and the largest and best of their kind. They must on no account stand near the other species of seed onions, for they will degenerate, and a mongrel race ensue.

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* This curious manner of being propagated is not peculiar to this onion. It is possessed also by that pest, the wild garlic, in addition to the increase of the latter by new roots (or tubers) which commence their growth under ground.—Ed. Far. Reg.

From the Horticultural Register.

MR. VAN MONS' METHOD OF RAISING GOOD FRUIT TREES FROM THE SEED.*

Translated from the French, by H. A. S. Dearborn.

Extract from the translator's introduction.

"In the whole history of discoveries, there is no one who is entitled to higher commendation, for the attention and industry bestowed, as well as for that remarkable fidelity of design, devotion of purpose and indomitable perseverance, which were evinced. Alone, unaided, unpatronized, and in fact discouraged—if it were possible to discourage such a man—by the total absence of favor and protection, the prejudices and customs of the enlightened as well as the ignorant, and the appalling disasters he encountered, still he nobly sought to establish a theory, which if even found correct, was not of a character to produce immediate eclat, or affluence; and would require a period probably greater than was consumed in the experiment, to give general publicity to his fame. He appears, in the course of his arduous and prolonged researches, like the incarnation of wisdom awaiting, with cool, collected, and determined resolution, for the recurrence of results, which, when obtained, afforded no other compensation or honor, than the enjoyment which a great mind derives from the discovery of a new fact, or the correctness of a hazardous conjecture.

"The theory and experiments of Mr. Van Mons have established a most important era in the history of pomology. It has resolved a question which, if ever even proposed, had bid defiance to all preceding ages. The comparatively small number of the varieties of each kind of fruit, were considered as the product of some other clime than that where they were commonly cultivated, or the accidental and mysterious present of fortune, in one of her sportive moods; but the success which has attended the experiments of the Belgian philosopher, has disclosed the process, by which nature accomplishes her wonderful work in the creation of new fruits, and has enabled man to avail of the secret, in such a manner, as not only to replace those which are necessarily exterminated by age, but to multiply the varieties to an illimitable extent.

"After the lapse of half a century, the great merit of Mr. Van Mons begins to be properly appreciated, and he has fortunately lived long enough to reap the only reward he desired, the gratitude of the world. There have been a combination of circumstances, which have had a most propitious influence, in giving notoriety to his highly commendable efforts. The rapidly increased taste for gardening and all branches of tillage, within the last thirty years, throughout western Europe and this country; the establishment of horticultural societies, and extensive nurseries; the attention which learned and eminent men have bestowed on useful and ornamental planting, and the numerous publications which have appeared for diffusing intelligence on all these subjects, seem to have been simultaneously brought in aid of the great labors of Mr. Van Mons; and to render them peculiarly interesting and acceptable. He has been fortunate, too, in the acquisition of such illustrious friends and colaborators, as Soulange Bodin and Poiteau, to comprehend and make known his valuable researches and precious contributions of excellent fruits. Those enlightened and generous heralds of his deeds, have rendered the name of Van Mons as familiar and dear to every intelligent cultivator of the earth, as those of a Cato, a Bacon, and a Du Hamel."

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"But there are unfortunately dark and odious incidents in the history of his country, and which have too often been the reproach of most nations —neglect and ingratitude towards one of its most illustrious men and greatest benefactors. Instead of being cheered on by public countenance and approbation, he received neither direct assistance or encouragement. Even protection from outrage was not afforded him; and three times were his invaluable nurseries exterminated under the sanction of the government. Still, in defiance of all the difficulties which he was compelled to encounter, he has triumphed gloriously.

"It is much to be desired, that Mr. Van Mons' theory should be adopted in this country, and more especially, as his process can be commenced at the point, which he was only enabled to reach, after extending his experiments through a period of forty years. It was not, until in the fourth and fifth generations of his trees raised from the seed, that they began to yield good and excellent fruit. He was obliged to begin with seed produced by wild trees; but in this country a great number of superior fruits have sprung up, as was predicted by Poiteau, from the planting of the seeds of successive generations of natural fruits. This has arisen from the manner in which our wide spreading population has been extended, which did not allow of that attention to the selection and propagation of the best varieties of fruits, by scions and buds; and nurseries are of very modern establishment, even in the oldest and most densely inhabited portions of the union. Besides the general inability to purchase and transplant to a great distance, valuable trees, the whole attention and labor of the pioneers of the wilderness, were required to procure the means of subsistence; and the luxuries of an orchard and a garden could not be obtained, until the necessaries of life were first secured, and even then fruit could only be generally multiplied, like the other products of agriculture; consequently, most of the trees have been raised from the seed, and having been commonly left in the natural state, their seeds have been again planted, and so on, from generation to generation, until we now find those superior kinds of fruit appear, in various parts of the United States, which

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*This article is not only valuable and interesting as throwing new lights on an important branch of agricultural science, over which total darkness has heretofore prevailed—but there is another source of interest presented in the detail of the long and untiring labors of Van Mons, under the greatest discouragements—and the successful results of his long course of experiment. In this point of view, M. Poiteau supplies for our journal part of the series of notices of distinguished agriculturists, which we have promised and already commenced, and which we hope hereafter greatly to extend.

The length of the account given by M. Poiteau, forbids copying (as above) more than a small part of the translator's introductory remarks.—Ed. Far. Reg.

Mr. Van Mons produced in the fifth generation. Such are many of our most celebrated apples, plums, cherries, pears, nectarines, and especially pears. The Andrews, Bloodgood, Cushing, Dix, Gore's Heathcot, Harvard, Lewis, Prince, Seckel, Wilkinson, and many others, may be classed with some of the best old, and newest European varieties.

Here then is an advanced position from whence to commence the experiment which Mr. Van Mons has so long and successfully prosecuted. Let the seeds from the fruit *borne on the parent trees* of those choice varieties be planted, and it is more than probable, all the trees thus obtained, would produce as good, and many of them superior fruits, to those of the originals; and their seeds being again planted and continued from generation to generation, the limit may be ascertained beyond which nature will not go, in the process of amelioration. At all events, taking Mr. Van Mons' theory as the basis of the experiment, we have the advantage of the generations which preceded, and may obtain results, in fifteen years, equal, if not superior to those he has only been enabled to reach in fifty years. We know not what is the generation of those extraordinary native trees. The ancestors of all the species of apples, pears, cherries, plums, and peaches which exist in a natural state, in this country, must have been generally grafted or budded trees, brought from Europe, and ten generations or more may have succeeded before they appeared in the perfection in which we now enjoy them, or not more than four or five."

THEORY OF VAN MONS, *or an historical account of the means which were employed by Van Mons to obtain excellent fruit from the seed.*

By A. Poiteau.

The great number of good and excellent new pears with which Mr. Van Mons has enriched Europe and North America, within the last forty years, seems to clearly prove, that the method he adopted to obtain them is superior to all others, as no one has obtained so many. Still although he never concealed his process, but published the principle with his catalogue of fruits in 1823, there has not been, within my knowledge a single nurseryman, or an amateur in France, who has attempted to practice it, either from a reliance in, or to verify the result.*

In 1833, the Royal and Central Agricultural Society of the Seine, offered a prize for good, and perfect new fruits; but the programme which was published by the society for that purpose, did not even name Mr. Van Mons's theory, or indicate any new method of arriving at the desired end, and left the competitors to the vague routine of sowing at hazard, and waiting until nature performed a miracle, in producing one good fruit among a thousand bad. Time will make known the result of the competitors; I shall therefore say nothing upon that subject at this time: but I cannot but regret, that in an age, when philosophers, chemists and physiologists are directing all their efforts to discover the process, or what is vulgarly called the secrets of nature, the Royal and Central Agricultural Society of the Seine, has not named Mr. Van Mons's theory—a theory which is now supported by so many repeated experiments, as to place it among the number of demonstrated truths.

I have said that in 1823 Mr. Van Mons published in a few words, the principle of the means which he had employed to obtain good new fruits. In 1828 I gave an account of some of these means in the "*Considerations of the process which is employed by nurserymen to obtain new ameliorated fruits, &c.*" published in the "*Annals of the Horticultural Society of Paris,*" Vol. III. page 288. Now I call the principle of these means Van Mons' Theory, and my object is to indicate its origin, to develope it and to support it by reasons and facts, to attempt to demonstrate its solidity, to cause it to be adopted, and to present it as one of the most learned and most useful discoveries which genius and reason have made towards the close of the eighteenth century.

Mr. Van Mons, could most assuredly present and explain his theory infinitely better than it is possible for me to do; but fearing that his numerous occupations, and above all his modesty might prevent him, I hope, at least, to be able to give a sufficiently clear idea to excuse the audacity of writing upon the useful and important discovery of that learned and venerated professor: and, besides, the fear I entertain that Mr. Van Mons will not publish his theory, I believe I shall render an essential service to the history, and chronology of fruit trees, in fixing the epoch of the origin of this history, as well as of that of those numerous good fruits for which we are in debt to him. We should at this time be very grateful to our ancestors, if they had left us a greater number of data, on the epochs and the circumstances attending the appearance of the fruits which they have transmitted to us, and which will probably disappear in the hands of our offspring; we should have had a fixed basis to calculate their longevity, the degrees of their infirmities, and their deterioration, subjects which have now acquired great importance and which it is difficult to determine, because man does not live sufficiently long to ascertain the phases of the deterioration of fruits. Still as this deterioration, soon or late, is certain, we are very much interested, not to trust to chance, the replacing of the old fruits, in proportion as they deteriorate, by new fruits, at least as good if not better than the ancient, which we are fated successively to lose, in consequence of their great age, the feebleness of their constitution and the diseases by which they are attacked.

In this state of things we should consider the theory of Van Mons, as a very precious discovery, as it not only enriches us with new fruits, the greater part of which are superior to those which we possess, but gives us the certainty of being able to replace those which are inferior, or which have deteriorated, by new varieties of excellent qualities; it is applicable to the renewal of stone and seed fruits; but it is in that of pears we have the most numerous examples of its efficacy, Mr. Van Mons being more particularly attached to this kind of fruit, (without however, neglecting the others,) as superior, not merely from its qualities, but from the length of time which several of its varieties may be kept.

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* I honorably except Mr. Bonnet of Boulogne-sur-Mar, an enlightened pomologist, who went several times to Louvain, to examine Mr. Van Mons' nurseries, and who has within three years sown seeds, according to the principles of that great master.

Origin and Developement of the Theory of Van Mons.

Mr. Van Mons, a professor of chemistry at the University of Louvain in the Kingdom of Belgium, since 1817, was born in Brussels in 1765. To the most precious gifts of nature, by which he was favored, was added a good education. The study of physic, and chemistry early accustomed him to carefully examine whatever came under his observation, and to seek the cause of every effect which he saw. From the age of fifteen years, his ideas were fixed on the *natura rerum*, and since that time his meditations, his researches, and his continual experiments, far from producing a change, have but tended to confirm them. A taste for labor which he has never lost, and an ardent desire for the acquisition of knowledge, enabled him at the age of twenty years, to be received as a pharmacopalist, to write and speak all the languages of Europe, and to correspond with the learned men of all nations.

Although Mr. Van Mons commenced his pomological experiments when a youth, and has not ceased to continue them, his vast capacity was not filled; he studied medicine to extend his knowledge, wrote a thesis on physiology, a subject which was much agitated at that time, and received the degree of Doctor, in Paris. He was born with such strength of mind, that he wrote and now does, on the gravest subjects, in the midst of noise, in the company of persons who talk loudly on frivolous subjects, and takes a part in the conversation without stopping his pen.

Mr. Van Mons enjoyed the reputation of a superior man, and the consideration due to his transcendent merit, when the revolution of 1788 burst forth. Belgium was immediately incorporated with France and Mr. Van Mons was chosen a representative of the people. His great perspicacity enabled him to discover the labarynth without end, in which public affairs were involved, and he wrote a treatise on political philosophy, in which he stated that the continuance of our dissensions was the only way in which that true and solid peace could be found, which we might in vain seek in any other manner.

It is necessary for me to recal these circumstances in relation to the youth of Mr. Van Mons, to induce the reader to think, that when a man of such a temperament, establishes a theory on the regeneration of fruits, after having practised his experiments during fifty consecutive years, it will be received with much greater confidence, as it quadrates with the course of nature.

At the age of fifteen Mr. Van Mons sowed, in his father's garden, the seeds of perennial flowers, roses and other shrubs, with the design of observing the developement, the successive generations and the variations which might thus be produced. To these he soon added seeds and stones of the well known fruits, and remarked that of all his young plants, the pears were those which least resembled their parent. He searched the gardens, nurseries, markets and neighboring provinces, to confirm or rectify his first ideas, on the causes of the variation in the flowers and fruits.

At the age of 22 years the basis of his theory was fixed, and he was established as a pharmacopolist. At that time he had a gardener named Meuris, in whom he discovered a disposition for observation; he initiated him into his pomological views, and in a short time Meuris was capable of laboring with success, as well alone as with his master. In their journeys they bought every where, wild and free stocks of fruit trees, which had a favorable appearance. They were so familiar with the characteristics, which the aspect, and the wood furnished, that they could purchase as well in the winter as in the summer. When their explorations were distant they took up the trees, which they obtained even in midsummer, and removed them immediately. By means of these acquisitions and their repeated sowings, Mr. Van Mons had, in a short time, 80,000 fruit trees in his nursery, which enabled him to make his experiment on a large scale and to more promptly obtain results.

Here is an example of the rapid conceptions of Mr. Van Mons. At the commencement of the French emigration, the properties of the *Rush toxicodendron*, being so much extolled in Belgium, a leaf of this plant sold for from 6 to 7 sous at Brussels; Mr. Van Mons planted cuttings in his garden for this use of his phramacy; and going one day to see his young plants, he noticed a gardener who was pruning the trees without regard to any principle. He immediately hastened to find Mr. Villebon, who was the phœnix of horticulturists at that time, and asked him what were the rules for pruning fruit trees; the reply was, "you are too old to learn them." "In two years," replied Mr. Van Mons, "I will teach you, in a book, which I shall publish." He then began to consult the French, English, Dutch, Russian and German works, and found that everything was to be verified and rectified. His correspondence has proved to me, that he immediately became, himself, the best book to consult, not only on pruning fruit trees, but on an infinity of operations in culture.

His repeated sowings, without interruption from parent to son, of annual flowers, and perennial shrubs which grew and fructified in a short time; his new excursions, which were longer than the preceding, to observe the wild types of our fruit trees, in places where they grew and reproduced in a state of nature; his new generations, which were obtained from wild and free or natural stocks,[*] as well as from the first sowings in his nursery; and his thousand upon thousand of divers observations collected from every quarter, have enabled Mr. Van Mons to establish a law, which admits of fewer exceptions; this law is, that so long as plants remain in their natural situation, they do not sensibly vary, and their seeds always produce the same, but on changing their climate and territory, several among them vary, some more and others less, and when they have once departed from their natural state, they never again return to it, but are removed more and more therefrom, by successive generations, and produce, sufficiently often, distinct races; more or less durable, and that finally if these varieties are even carried back to the territory of their ancestors, they will neither represent the character of their parents, or even return to the species from whence they sprung.

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[*] I have observed in Mr. Van Mon's correspondence with me, that he does not use the word *free* or *natural*, but that term with him is synonymous with *variety*. With us a tree is called *free* or *natural*, which is produced from the seed of a domesticated fruit, and in fact all trees which have not been grafted: thus we say a *free* or *natural* Rose, Camellia, Magnolia or Pear, when they are produced from the seed, cuttings or layers; and we particularly apply the epithet *wild* to pears and apples, which grow naturally in the woods, and whose fruit is not eatable.

Mr. Van Mons has introduced wild pear trees, into the middle of his nursery, of the best perfected varieties; these wild trees, or subnatural species, as he calls them, have not varied and continued to yield poor acid fruit; the seeds of this bad fruit have been sown, and they have always produced wild trees, and although these wild trees flourish in the midst of the perfected varieties, the seeds of both being sowed neither produced any hybrids, from which, Mr. Van Mons concludes, that there cannot be a cross fecundation between a natural species and a variety. He does not deny that the species can be mutually fecundated, or that the varieties can also be in like manner fecundated; but he maintains, that the plants which are the result, never offer an appreciable resemblance, either to the father or mother. The origin, therefore, which Linnæus has given to the *Datisca canobina* may be considered fabulous. Besides, he does not believe that hybrids are so frequently produced, as has been alleged.

Mr. Van Mons has been the first to ascertain and assert, contrary to appearance and common opinion, that double flowers are not a variation, but rather a sign of what he calls *feebleness*. This assertion, which may be considered bold for the age, has since been ranked among the number of truths from the fact, that it has been ascertained, there is less solid matter in all the supernumerary petals of a double flower than there would have been in the seeds, if the flower had not been double.

But there is a point on which all will agree with Mr. Van Mons, which is, that the varieties of the most delicate fruits, are those which are the shortest lived, all things besides being equal; and from experiments which he has made, full credence will be given to the assertion, that a scion taken from an apple grafted on a paradise stock, or from a pear grafted on a quince, does not succeed well when placed on a free stock. Experiment, in fact, proves, that if the paradise and quince render the grafts more precocious, and give a greater volume to the fruit, they impair the vigor of the tree, and abridge its life, by not furnishing sufficient nourishment; and it is easy, therefrom, to conclude, that a scion taken from such a tree, has already been impaired. From these facts, Mr. Van Mons not only recommends that scions be always engrafted on free stocks, but that those individuals be selected which appear most to resemble in vigor and physiology, the varieties which are to be engrafted upon them—a condition very much neglected in sale nurseries. In those establishments, a subject having the appearance of a Beurre, or a D'Aremberg, there is grafted upon it a Blanquet or an Aurate, if it is found in the row destined for Blanquets and Aurates.

As I shall often have occasion to use the words *degeneracy* and *deterioration*, or their derivatives, it seems necessary that I should here fix the sense in which I employ them. Degeneracy, in culture, is applied to the seeds of fruits and flowers, which have been improved by variation. Seeds degenerate, or have degenerated, when the plants which are produced from them, no longer present certain qualities, which are found in their predecessors—qualities which they have acquired by variation. Philosophically, this is not a real degeneracy, but, on the contrary, a quality, a return towards the state of nature. As civilians, we say, that a man degenerates, if he abandons the social state, and the advantages, whether real or not, which he has acquired, at the expense of his liberty, and goes to enjoy his independence, and all his liberty, far from the chains of society, while philosophy says that this man resumes his rights, and re-enters into a state of perfect nature.

Deterioration, in pomology, applies to fruit trees and their fruits; a tree is deteriorated by age, disease, a poor soil, bad culture, an unfavorable exposure, the weather and adverse seasons, &c.; fruits are deteriorated by the same causes, except the old age of the tree which bears them, which old age, when it is not too far advanced, generally improves them.

The degeneration of the seeds of fruit trees in a state of variation, being the pivot of the theory of Van Mons, it is necessary that it should be clearly presented.

As long as plants in a state of nature remain in their natal soil, they produce, during their whole life, seeds which do not degenerate. Seeds taken from a Baobab that was two thousand years old, produced trees like itself, quite as well as those which it had borne at the age of twenty years. Wild pear trees, in a state of nature, and in their native soils, always reproduce seeds, without any sensible variation. It is not the same with plants born in the state of variation, either in consequence of having changed the climate, the territory, or from some other unknown cause. The seeds which a domesticated pear—that is to say, one which has been for a long time in a state of variation—yields at its hundredth fructification, produces trees not only very different from itself in consequence of its being only a variety—and the bounds of variation are not known in descending from parent to son—but still very different from the trees which have been produced from the seed of its first fructification; and the older a domesticated pear becomes, the nearer do the trees produced from its latest seeds, approach to a state of nature, without, nevertheless, being able ever to return to it, as Mr. Van Mons affirms.

Now let us examine how the annual culinary and ornamental plants are governed, which have been for a long time in a state of variation. The seed are annually sown, and whatever be the variation, which the new generation undergoes, it preserves the principal characteristics of its parent, and scarcely an individual is discovered, which exhibits a tendency to return to a state of nature. When beautiful balsams, and excellent lettuces are once obtained, they are easily preserved as such, and their variation seems, sufficiently often, rather an effort to become more beautiful, than a disposition to return to the wild state of their ancestors.

From these two extreme facts, and an infinite number of others which are intermediary, Mr.

Van Mons has arrived at this conclusion: that as the seeds of the first fructification of an annual plant, in a state of variation, produces plants, which may vary without removing far from the state of their parent, while on the contrary the seeds which are yielded by the hundredth fructification of a domesticated pear of excellent quality, or for a long time in a state of variation, produce a great variety of trees, which neither resemble their parent, and whose fruits almost always detestable, are more or less, near to a wild state; this difference should have its cause in an unfavorable modification—*in a degenaracy which the seed of the pear undergoes in consequence of the age of the variety which bore it.*

Having arrived at this conviction, Mr. Van Mons has said: by sowing the first seeds of a new variety of fruit tree, there should be obtained trees always variable in their seeds, because they can no longer escape from this condition, and which are less disposed to return toward a wild state, than those produced from seeds of an ancient variety; and as those which tend toward a wild state have a less chance of becoming perfect, according to our tastes, than those which are in the open field of variation, it is in the seminary of the first seeds of the newest varieties of fruit trees, that we should expect to find more perfect fruits according to our tastes.

The whole theory of Van Mons is contained in the above paragraph; it was to verify it, and put it in practice, that from that period he collected in his nursery young wild trees, young free stocks, and sowed large quantities of the seeds and stones of various kinds of fruit trees, in order to have their first fruits, and to sow their seeds in turn to obtain a generation, of whose novelty he was sure, and to take it as a point of departure for his experiments. Although Mr. Van Mons operated on thousands of various kinds and different varieties of trees at the same time, I will assume, in order to render what I say more clear, in explaining his progress, that he made his experiments on a single variety of pear.

As soon as the young pear tree with which he began his experiments, produced its first fruit, Mr. Van Mons sowed the seeds. There resulted a first generation, the individuals of which, although of very different kinds, did not resemble their parent. He cultivated them with care, and endeavored to hasten their growth, as much as possible, by all the known means in his power. These young trees yielded fruit, which were generally small, and almost all of them bad. He sowed the seed of these and obtained a second generation without interruption—which is very important—that were very different in kind, but did not resemble their parent, although they had a less wild appearance than their predecessors. These were cultivated with equal attention, and they fructified earlier than had their parent. The fruits of this second generation, also varied as much as the trees which bore them, but part of them appeared less near the wild state than the preceding; yet only a few possessed the requisite qualities to entitle them to preservation. Constant in his plan, Mr. Van Mons sowed the seeds and obtained a third continued generation, the greater part of the young trees of which, had a *phasis* of good augury, that is something of the physiognomy of our good domesticated pear trees, and they were consequently less various in appearance. Being carefully cultivated, as had been the preceding, these trees of the third generation, fructified still earlier than had those of the second generation. Several of them produced edible fruit, although not yet decidedly good, but sufficiently ameliorated to convince Mr. Van Mons that he had discovered the true path of amelioration, and that he should continue to follow it. He also recognised, with no less satisfaction, that the oftener the generations succeeded each other, without interruption, from parent to son, the more promptly did they fructify. The seed of the fruits of this third generation, which had a good appearance, were sowed, and the trees managed as carefully as the preceding, and produced a fourth generation, the trees of which were a little less varied, and nearly all of them had an appearance of favorable augury; they fructified in a shorter time than the third generation; many of the fruits were good, several excellent, but a small number still bad. Mr. Van Mons took the seeds of the best kinds of these pears, sowed them and obtained a fifth generation, the trees of which were less various than the preceding, fructified sooner, and produced more good and excellent fruits, than those of the fourth.

It was after the result of this fifth generation, from parent to son, that Mr. Van Mons made known the process which I have explained. Although having arrived at a most happy conclusion, and where others in his situation would have stopped, I know that he continued his experiments to 1834, and that he now does, and has reached the eighth generation, without interruption from parent to son, and that at each remove he always obtains fruits more and more perfect.

Mr. Van Mons made the same experiment upon almost all the other kinds of fruits. The apple yielded no other than good fruit in the fourth generation. The stone fruits, as the peach, apricot, plum, and cherry, became perfect in a still shorter time; all of them produced good and excellent fruits in the third generation; which should be the case, for our stone fruits always reproduce more or less good without any particular attention, and therefore they should with less difficulty and in a shorter time, arrive at a perfect state of amelioration.

After having presented in a succinct, but I hope a clear manner, the theory of Mr. Van Mons, and the means which he employed to put it in practice, it is proper that I should say a word as to the time which is required to obtain good fruit, in order that any one who wishes to verify or adopt it, can proceed according to his principles.

The first thing which preoccupied the attention and excited the anxiety of Mr. Van Mons, in the commencement of his experiment, was to ascertain how many years it required to arrive at the result which he sought to obtain; how many generations would be necessary, and how many years each generation would require to produce its first fruit. This first consideration, appalling to ordinary men, did not arrest Mr. Van Mons in his course. He put his hand to the work, and learned that three or four generations, without interruption, from parent to son, and from twelve to fifteen consecutive years, were sufficient to obtain no other than excellent fruit from the stones of peaches, apricots, plums and cherries: that to obtain no other than excellent apples, only four successive and uninterrupted generations, from parent to son, and about twenty consecutive years, were required. As to the pear, the difficulty was greater, but not insurmountable, as we shall see. At first, Mr. Van Mons was unable to procure the seeds of varieties very recently procreated; the seeds which he was obliged to use to commence his experiments with, were obtained from ancient varieties, whose age, although uncertain, was much advanced, which from experience tended to retard the first fructification of his young trees. Nevertheless, Mr. Van Mons has been able to ascertain that twelve or fifteen years was the mean term of time which evolved from the moment of planting the first seed of an ancient variety of the domesticated pear, to the first fructification of the trees which sprang from them.

The trees from the second sowing of the seed of the first generation, have yielded their first fruit at the age of from ten to twelve years, as the mean term; those of the third generation, at the age of from eight to ten years; those of the fourth generation, at the age of from six to eight years; and finally, those of the fifth generation, at the age of six years. Mr. Van Mons being actually at the eighth generation, has informed me that he has obtained several pear trees which fructified at the age of four years.

From this decreasing progresson, it may be seen that the fear of a lengthened experiment ought to decrease in proportion as it advances, and that adding the requisite years in the first five generations of the pear, a point is reached where none other than good and excellent pears are obtained, at the end of forty two years. But if in each generation, as has been shown, there are always several trees which do not await the mean term named for their fructification, the time may be estimated that thirty-six years for obtaining from the pear, in five uninterrupted generations from parent to son, new trees and fruits, all of which are of excellent quality. The time can still be more abridged; for in one of his last letters, Mr. Van Mons informs me that from two of his first sowings of pears, there were trees produced which fructified at the age of six years.

I have collected much of what I have stated, and what I have yet to relate, in the nurseries of Mr. Van Mons, at Louvain; but it is from the correspondence of that venerated professor, that I have obtained the groundwork of my discourse; and as that correspondence had for its object my sole instruction, and not that of guiding me in a compilation which I had not contemplated, it follows that what I have still to communicate has not that natural connexion which I desired it should have assumed, and will consequently appear, to a certain extent, as detached articles.

When Mr. Van Mons commenced raising trees from the seed, he had already seen in other nurseries, that the seed of the varieties of the pear genus reproduced neither the characteristics of the tree, nor those of the fruit from which they sprang; therefore, he was not restrained, as may be said, to *raise by species*. But he had gone farther and ascertained that the ten seeds of a pear produced ten different trees, and ten different fruits. Still his manner of sowing is very near that of all nurserymen. He left his plants in the seed bed two years; he then took them up, and part of them he threw away as worthless, and transplanted the most vigorous at such a distance one from the other, that they could thoroughly develope themselves and fructify. He considered it best to plant them sufficiently near, in order to force them to run up tall, and to form pyramidal tops, without pruning; this hastens, he states, their fructification. I have seen squares of pear trees in his nursery at Louvain, at the epoch of their first fructification, and they appeared to be about ten feet apart. While waiting for the young trees thus planted to fructify, there is afforded an opportunity of studying their form and physiognomy, and to establish the prognostics of what they may become, from their different exterior characteristics.

Mr. Van Mons has ascertained that it is scarcely before the age of four years that young pear trees develope their characteristics; and that before this age, it is rarely possible to presume what each individual may become. It is not until the second or third year after the seedlings have been transplanted, that Mr. Van Mons begins to examine them for the purpose of ascertaining the prognostics of each individual. In the commencement of his experiments, it was sufficiently easy for him to recognise as good auguries in those young trees, which showed from their form, wood and leaves, a resemblance to our good ancient varieties. But as he obtained a great number of excellent new fruits, which presented new characteristics, sometimes analagous and sometimes opposed to those of our good old varieties, it was much more difficult to establish the data for ascertaining what the young trees raised from the seed may become; for he obtained excellent fruit from trees of a very bad appearance. Still from long continued observations, he has established the following prognostics:

1. *Prognostic of favorable augury.* A good form, a smooth and slightly shining bark, a regular distribution of the branches, in proportion to the height of the tree; annual shoots bent, striated, a little twisted, and breaking clean without splinters, thorns long, garnished with eyes or buds, their whole, or nearly whole length; eyes or buds plump, not divergent, red, or grizzled; leaves smooth, of a mean size, crimped on the sides of the middle nerve, borne on petioles rather long than short, the youngest, in spring, remaining a long time directly against the bud, the others, or the inferior, expanded, hollowed into a gutter from the bottom towards the top, but not their whole length.

2. *Prognostics of bad augury.* Branches and twigs confused, protruding like those of the hornbeam, or broom; thorns short, without eyes; leaves averted from the bud, from their first appearing, small, round, terminating in a short point, guttered their whole length. These characteristics indicate small fruit, flesh sweet and dry, or baking fruit and late.

3. *Prognostics of early fruit.* Wood large, short; buds large and near.

4. *Prognostics of late fruit.* Wood slim, branches well distributed, pendent, the shoots a little knotted, generally denote late delicious fruit; with leaves round, point short, stiff, of a deep green, borne on petioles of mean length, are analagous signs, but less sure.

I wish much, that Mr. Van Mons had indicated, by what sign we could determine, when a young pear tree promised large fruit, but he has been silent upon this subject, whilst he has given, as the characteristic of good augury, an annual twig, which breaks cleanly and without splinters.

I have stated that Mr. Van Mons does not agree in opinion with those, who attribute the deterioration of fruit trees to their multiplication by repeated ingrafting; now I recollect that Mr. Knight has written, that if the parent tree of an ancient variety is found, it can be regenerated, by taking scions from it. This expresses with sufficient clearness that Mr. Knight, the most learned pomologist in England, thinks fruit trees of free stocks, or natural trees, deteriorate much less rapidly than those multiplied by grafting, which accords with the opinion of Mr. De Murinais, and Mr. Bonnet. Mr. Van Mons, on the contrary, maintains, that free stocks or natural and grafted trees, deteriorate in the same manner and with the same rapidity, in consequence merely of their age; and that it is age alone which causes our fruit trees to deteriorate, and their seeds to degenerate. The following is an example in support of his theory. In the course of his pomological experiments he discovered in an old garden of the Capuchins, the parent tree of our Bergamote de la Pentecote, which is at this time a sufficiently old pear, and all the trees grafted from it, are affected with canker in slightly moist land, and the fruit is small, cracks when growing in the open air, is covered with black spots, which communicate a bitter taste to the flesh, and finally it no longer succeeds, but when trained as an espalier, along a wall. Very well: the parent tree of this Bergamote, was infected with all the evils which are found in those grafted from the same variety; Mr. Van Mons detached rooted suckers or sprouts, and at the same time took scions which he grafted on other stocks, and the trees produced from both, were neither more or less deteriorated, than those of our gardens, which have been for a long time, multiplied by the graft. Therefore, it is age only, to which should be attributed the natural and gradual deterioration of our varieties of fruit trees, as well as the equally gradual degeneracy of their seeds. I say natural and gradual deterioration, for Mr. Van Mons is not ignorant that there are certain morbific traits, which are communicated from the stock to the graft, and from the graft to the stock.

The subject of deterioration naturally leads to the inquiry how many years a variety of pear may live. Mr. Van Mons estimates that it may live from two to three hundred years, and that if at this age it is not extinct, its fruit is so deteriorated, that it no longer merits being cultivated; consequently he does not believe in the antiquity of fruits which, it is said, have been transmitted to us from the Romans.

Mr. Knight is of opinion, the deterioration is still more rapid, and assigns a shorter term to the existence of our varieties of fruit trees. This author even asserts, that it is not long since our old fruits were still better than they now are. But it is doubtful whether Mr. Knight can furnish the proof.

The thorns, with which the greater part of young free pear stocks are covered, disappear with age; but the tree can reproduce them in an advanced age, if a sprout is developed on the trunk, or if its vigor is augmented. Thus have I seen, in Mr. Van Mons' garden, pear trees renew their thorns, after having ceased to produce them. In Paris it is only necessary to head down a large orange tree without thorns, to see it throw out new branches covered with them.

There are free stocks of old varieties of pears, which have the power of causing the fruits which are engrafted upon them, to grow to an extraordinary size—double, says Mr. Van Mons. It is a quality which the free stocks of new varieties do not possess, and which Mr. Van Mons cannot explain. In fact we often see trees which constantly yield fruit larger than others of the same variety, all things, in other respects, being equal. An inverse appearance, is often presented, to the florists of Paris; there are lemon trees, whose stocks become diseased, and cause the oranges which have been budded upon them to perish, in four or five years.

When the young pear trees, procreated from parent to son by uninterrupted generations, begin to produce edible fruit, they are generally summer fruits. It is necessary that the uninterrupted generations be more numerous, to obtain winter fruits, or such as keep long.

In proportion as the uninterrupted generations are multiplied from parent to son, the great differences which are first observed between the trees and their fruit, diminish in an inverse progression; wild forms, or appearances are no longer seen; all of them have an air of civilization, and their fruits no longer deviate from good. In the last package of fruit which Mr. Van Mons sent me, a considerable number of the pears naturally take rank among our Beurres and Doyennes in form, volume and quality, and all these fruits to the number of sixty varieties, were the first of a sixth generation, without interruption from parent to son.

Mr. Van Mons remarks, that among the new pears, he has obtained, there are some which were several years in taking a fixed form; that several did not assume one, for from twelve to fifteen years, and that others never did. Our old varieties, without doubt, have been in the same situation, and he gives as an example of pears, which have never assumed a determinate form, our Bon Chretien D'Hiver; still it is a pear the most easily recognised, notwithstanding the variation of its form and size.

Mr. Van Mons considers it an invariable principle, that a graft does not bloom sooner than the parent stock from which it was taken. Nevertheless, a contrary opinion universally prevails among nurserymen. They often graft scions taken from young trees, in the hope of hastening their floration, and sometimes succeed; but, in this case it may be said, that the scion taken was predisposed to bloom, and that it would equally as soon have done so, if it had remained on the parent tree. It is the same with regard to buds. The first *Astrapœa pendula*, which bloomed in France, was a bud taken from a stock in the Garden of Plants, which did not begin to bloom, until several years after. Finally, there are so many accidental causes, which advance or retard the floration of grafts and their parent stocks, that it is difficult to ascertain whether they should bloom simultaneously, or one after the other, while numerous facts attest, that the multiplication, repeated by bud, accelerates the floration and diminishes the volume, in a great number of species.

Mr. Van Mons has ascertained, that it is advantageous to collect the fruit a little before it is fully ripe, from which it is desirable to obtain seed for planting, and to leave it to become perfectly mellow, and reach a state of decay, before extracting the seeds or stones. He admits, with Mr. Knight, that the apple deteriorates less rapidly, and lives longer, than the pear. This cannot be doubted, when we compare the facility of rearing apple trees in almost any kind of soil, with the difficulty of finding one, which is suitable for the pear.

The learned professor much prefers the white thorn, *Mespilus oxyacantha*, to the quince, as a stock for grafting our ancient varieties of pears upon. Pears grafted on a thorn, he says, grow higher, have a more perfect pyramidal form, and produce their fruit nearer the trunk. I agree entirely in opinion with Mr. Van Mons; first, because the pear takes perfectly on the thorn, which is an indigenous tree, rustic, not difficult to cultivate, and of easy multiplication from the seeds; and secondly, because complaints begin to be made of the quince, not only on account of its three varieties giving different results, but in consequence of its being deteriorated by its extended multiplication by suckers and cuttings; and because it does not succeed well, in all kinds of land. As to the choice of the best variety, an error, committed in this respect, in the nursery of Luxembourg, has excited great complaints on the part of those who have obtained pear trees from that establishment, which has proved for the thousandth time, that the quince tree of malformed fruit, is not so good for stocks, as that which yields pyramidal fruit. As to the superiority of the white thorn over the quince, it is a question which will soon be settled with us; for when the Horticultural Society of Paris received the collection of pear scions, which was sent by Mr. Van Mons in the spring of 1834, there were not a sufficient number of quince stocks, at command, for all of them, and Count De Murinais caused a portion of them to be placed on the thorn: they have taken perfectly well, grown admirably, and give the most favorable indications of a fortunate result.

From the data which Mr. Van Mons has given, we are induced to think, that the pears which do not succeed with us, unless trained as espaliers, against a wall, have not always required that favorable position,—that they are now irreclaimable, on account of the weakness of old age, the deterioration which they have sustained, and the decrepitude which threatens them, and that finally, a time will arrive, when in spite of our cares, they will no longer be good even as espaliers, and will be abandoned and become extinct. To illustrate the principle of that able pomologist on this subject, I will add, that when a variety is enfeebled by age, or its temperament exhausted, it is best to graft it on a quince, in order that it may receive only a moderate nourishment, and should never be put on a free stock, whose too copious supply of aliment would hasten its destruction.

Mr. Van Mons has remarked, that the new varieties of pears which he obtained by repeatedly planting the seed from generation to generation, without interruption from parent to son, neither possessed the rusticity or the longevity of old varieties, and that those whose fruit was the best, were also those which indicated the shortest term of longevity. All this is in conformity to the course of nature, and it is proper that we submit to it. Mr. Van Mons has given the explanation of this fact. When there is no interruption between the generations of our varieties of fruit trees, nature cannot reclaim her rights; she has not time to modify the seed according to her manner, to make them resume a part of their old wild character; but if a space of fifty years is left between two generations, the individuals of the second, bear the marks of rusticity, and a tendency towards the wild state, which nature had developed in the seeds of their parent during those fifty years. This in fact, happens, when the seeds of an old variety of a fruit tree are sown.

Here I am bound to attempt to present the opinion of Mr. Van Mons without alteration, and to add thereto my reflections, and some adverse views whether well or ill established; but finally it is time that I leave him to speak for himself and express in his own cogent style, his manner of observing the progress of deterioration and decrepitude in our varieties of fruit trees.

"I have remarked," he says, "that the most excellent beyond all others, least resist the ravages of old age, and become sooner old than the varieties whose birth preceded them; they cannot attain an age of half a century, without manifesting symptoms of decrepitude. The first of these symptons, is that of bearing less constantly and the fruit ripening later. The decay of the wood, the loss of the beautiful form of the tree, and the alteration of the fruit follows at much later periods. The varieties which have existed but half a century do not suffer from the canker at the ends of the branches, nor from diseases of the bark; the fruit does not crack, is not filled with a hard substance, covered with knots nor insipid or dry; the alternates, are but a year: these varieties can still be grafted on other trees, without their infirmities being augmented. It requires half a century more to end their sufferings, and the general destruction of the varieties is the only remedy which can be applied to its diseases. It is painful to think, that soon the Saint Germain, the Beurre Gris, the Crassanne, the Colmar and the Doyenne [St Michaels] must submit to this destruction. None of these varieties any longer succeed with us [in Belgium] except when engrafted on the thorn and as espaliers; but this success is at the expense of their commendable qualities. During my youth these varieties in my father's garden, presented superb trees, in good health, and rarely was there any imperfection in their fruit. *O quantum distans ab illis!* What a loss in a time so short—in the space of sixty years! I repeat, the advantage of youthful variation, is being without any imperfections."

I ask permission of Mr. Van Mons to doubt, a little, such an alarming rapidity in the enfeeblement of our varieties of Pears. I well know that almost all those, with which I have been acquainted for fifty years, are affected with different maladies; that in passing through the nurseries, trees are seen, which have been grafted from our fine pears, in the bark of the stocks of which, are numerous defects; the branches are cankered, the extremities of the young twigs are black and they lose their leaves before the natural epoch,—all diseases, which Count Lelieur places among the number of those that are incurable; but the author, although very particular, has nevertheless, found here and there trees upon which he did not discover any disease, and which he allowed the gardener of the Emperor to introduce into the gardens of the Crown. I am well persuaded, that our varieties of fruit trees, considering their origin, cannot have the tenacity, the indefinite life of the natural species; but I also believe that there are imperfections, individual maladies, which do not equally attack the whole variety; that the variety, for example, we call Beurre Gris, which is in a state of decrepitude, is extinct in some places, while it still exists in others. Mr. Van Mons himself affirms it, in saying, that in Belgium, there are varieties, which no longer succeed, except as espaliers trained against a wall; and finally, I believe that, if scions had always been taken from the most healthy individuals to perpetuate the varieties, we should not have seen so many trees affected with diseases, which abridge their existence and which also contribute, for the same reason, to shorten that of the whole variety. If now then, it is adopted as a principle, never to take scions but from young and healthy trees, and to insert them only on vigorous free stocks, the varieties will be longer preserved in a healthy state, than is the case at the present time.

Still, whether the deterioration of our fruit trees, be naturally slow as I think, or rapid, as Mr. Van Mons and Mr. Knight have asserted, it is not less certain, and it is well to think of some method for replacing them. Our manner of sowing the seeds and trusting to chance, for obtaining a good new fruit, is not certainly the best, as experience has sufficiently proved. Besides, chance does not merit the confidence of a reasonable man, especially when the probabilities are adverse. It is necessary then to have recourse to science, which is founded on reasons deduced from particular facts, and from whence flows that which is called a principle; and when this principle agrees with the course of nature, and is not contrary to any known fact, it seems to me, that it should be adopted as a truth, and be employed with confidence.

Such is, in my estimation, the theory of Mr. Van Mons, and it is to be considered as the best and most prompt means of regenerating our fruit trees, that is to say, of replacing the old deteriorated varieties by new varieties, which are perfectly healthy and bear excellent fruit. I have presented, as clearly as was in my power, the process employed to put it in practice, to induce the friends of our country to naturalize it; and in order to inspire more confidence, I have dared to say a word on the transcendent merit of its author, for which I ask a thousand pardons of his modesty.

I might yet add to this corollary many remarks, made by Mr. Van Mons on fruit trees and their culture, for his correspondence is very copious in facts; but I believe I have said sufficient to support the theory of this learned professor. I therefore, hasten to complete my memoir, by fixing the epoch of the removal of his nursery from Brussels to Louvain, and giving an idea of the incredible obstacles which he was obliged to encounter, in his pomological career, instead of the encouragements which were due to him, and shall finish, by a description of some of the excellent fruits obtained by Mr. Van Mons, and few or none of which are yet known in France.

After Mr. Van Mons had been a distinguished professor of physic and chemistry for seven years in the central school of the department of Dyle, and after the fortunes of war had separated Belgium from France, King William rendered justice to his merit, by naming him professor of the same subjects in the University of Louvain, in 1817, six months even before that University was re-established. Louvain being only about six leagues distant from Brussels, Mr. Van Mons could at the same time perform his duty as professor, superintend his nursery, and pursue his experiments. He was then at the apogee of his pomological career; he had more than 80,000 trees in his *Pepiniere de la Fidelite* [Nursery of Fidelity] the greater part of which were pears raised from the seed; several compartments were in their fourth, fifth, and sixth generations without interruption, from parent to son, and produced delicious fruits. He had for several years sent scions to Germany, England and the United States of America; nevertheless, except his friend Bosc, Mr. Vilmorin, Mr. Leon Leileric, and Mr. Bonnet, there was scarcely an individual in France, who knew that Mr. Van Mons existed; such is the empire which routine and apathy has among us. The English and American catalouges are filled with Mr. Van Mons, fruit; and it was not until 1834 that we find a few of them described, in the new edition of Mr Noisette's *Jardin Fruitier.*

To decide upon the character of these new fruits, Mr. Van Mons assembled three or four friends who were superior judges; they tasted them, wrote down the qualities of each, and Mr. Van mons preserved only the trees that produced fruit which was decided to be good and very good; the same proof was repeated two, three, and four times in succession, and it was not until after these repeated trials, that he decided to take grafts from the trees which bore them. On this subject, I should here make a few remarks, to dissipate the doubt which some persons still entertain, on the care which Mr. Van Mons took to propagate only excellent fruits. In the first place, it should be observed that every year is not favorable to the perfect development of the good qualities of fruit, and that if a fruit generally delicious, is tasted for the first time, in an unfavorable year, an inferior quality may be discovered. It was thus that in 1833 I did not find in several samples of *Poiteau's pear* those excellent qualities, which Mr. Van Mons had recognised during four successive years, and which had determined this learned man, from motives of friendship, to honor me by affixing to it my name. In the second place, it was always impossible for Mr. Van Mons to collect the scions himself, as he was too much occupied, which explains why it sometimes has happened, that an indifferent variety has been received, instead of a kind worthy of propagation. It was evidently from an error of this kind, that Mr. Vilmorin received, under the name of Beurre Fourcroy, a Pear tree of a very late kind, the fruit of which had no merit; for Mr. Van Mons had tasted the Beurre Fourcroy several years in succession, and had found it worthy of being dedicated to that most learned chemist, who had accepted the dedication, a little time before his death.

Mr. Van Mons fully enjoyed the result of his long continued experiments; he was happy in diffusing with real disinterestedness, and the greatest complacence, his new fruits, the greater part of which were superior to those with which we are acquainted, when in 1819, *exabrupto*, the land on which his *Nursery of Fidelity* was located was decided to be indispensable for streets and building lots, and he was summoned to vacate it in the short space of two months, under the penalty of seeing all his trees cut down and thrown into the fire. Such an injunction would have been fatal to many persons, other than such a man as Mr. Van Mons; he was sensibly affected, but not frustrated; his noble character, his profound knowledge of men enabled him to surmount this reverse of fortune and disposed him calmly to seek elsewhere, another place for his establishment. As professor in the University of Louvain, he resolved to transport his nursery to that city, that he might have it under his management, without leaving the University; but the period assigned for evacuating the land was unfortunately, that of mid winter,—from the first of November to the last of December. Mr. Van Mons had at his disposal, only a part of Saturday and Sunday in each week, when he could go to Brussels; to collect the scions, to mark the most precious trees and give the requisite orders for the others, was all that he could do himself: and another garden as extensive as that which he evacuated, was required for the reception of his trees. His loss was consequently great and irreparable, from the unfortunate position in which he was placed, being obliged to confide nearly the whole of the care and labor of removal, to persons not well qualified, and who were incapable of comprehending the deep interest which he felt for the preservation of his trees. It was with great difficulty that he saved a twentieth part of his nursery, and this twentieth consisted only of scions for grafting. The remainder were sold or given to whoever would take them. After such a catastrophe Mr. Van Mons considered it necessary to guard against being ever again exposed to such a calamity. But incapable of distrust, he hired a piece of land in Louvain, which unfortunately belonged to the city, as a receptacle for the ruins of his nursery at Brussels, and continued his sowings and experiments.

Except, having a great number of young plants broken down and drawn out of the ground, by the masses of ice which were left on the ground for several days, after a great freshet in the river which passes through Louvain, occasioned by an unusual thaw in 1830, and which overflowed his nursery to the depth of seven or eight feet; if, I say, we except this flood, Mr. Van Mons enjoyed more or less quietly his new location, during thirteen consecutive years. His correspondence was renewed and extended, his losses were replaced by new acquisitions, the mass of his observations were augmented, and he continued to introduce into his nursery good new fruits, obtained by other amateurs, such as Messrs Coloma, Capiaumont, D'Hardenpont, the Abbe Duquesne, Gossart, Wirthum, Derlenfcourt, Diel, Liart, Knight, and an hundred others, and he distributed scions of these good fruits simultaneously, with those of his own; for his sole end has always been to multiply those which were good, and to enable the whole world to enjoy them. But he never sacrifised any trees raised from the seeds, to receive the scions which were sent to him from all quarters—even from North America, before the character of its fruit had been decided: he therefore annually purchased stocks for the reception of the grafts, which were sent to him and for preserving his own varieties, that he might more liberally disseminate them. For this purpose, he adopted, in his nursery at Brussels, a kind of grafting which he calls *graft by copulation*, and he continues to practise it at Louvain with great success.

Until 1823 Mr. Van Mons had not distributed any of his trees or scions, without numbers being attached to them, which corresponded with similar numbers affixed to the parent-stocks in his nursery, that enabled him to answer all the queries which might be addressed to him, by the persons to whom he sent scions. At this period, having been confined to his bed by a severe wound, he compiled from his registers and published a catalogue, in which we find about 2000 varieties of fruits, in which the names are placed opposite the numbers of those from which scions had been taken and distributed, makes known the principle of his theory, describes some of the details of his culture and his manner of making experiments: there are also in it some remarks on the causes which compelled him to abandon his nursery at Brussels. There are several things worthy of attention in this catalogue; first, the interruptions in the series of numbers; for example, in the second series we find number 850 immediately after 840, which indicates that nine intermediate numbers were attached to nine trees of favorable augury, but whose fruit had not yet been decided upon as to quality: second, the names followed by the words *by us* naturally indicate that the varieties thus designated have been produced from the seeds by Van Mons; third, when the name is followed by the words *by its patron*, they indicate that the name of the variety is that of the person who has obtained it from the seed. But there is one very important thing which Mr. Van Mons did not think of, and which would have been very useful in the history of fruit trees, especially to ascertain the course and progress of their deterioration, this was, to have fixed the year of the birth of each of the new varieties, designated in his catalogue. Mr. Van Mons was alone capable of doing it: when I spoke to him about it, he replied that his intention had not been to establish a science, but rather to do a good act, which would be immediately useful by the dissemination of good fruits; still he regrets having left this hiatus, which his notes do not now enable him entirely to fill up.

As I have before stated, Mr. Van Mons enjoyed his fifty years of experiments, in enriching us with good excellent fruits; but *public utility* had sworn that she would finally embitter his old age. In 1831 we besieged the citadel D'Anvers, and although Mr. Van Mons nursery was fourteen leagues distant from the army, the engineers could not find a more commodious place than that nursery, to bake the bread of the soldiers in; consequently a great part of Mr. Van Mon's trees were destroyed, having constructed their ovens on the ground where they grew, and the fruit of the others was exposed to pillage. Still the philosophy of Mr. Van Mons sustained him in this unexpected devastation; he hired two other tracts of land, into which he removed his young plants of the seventh, eighth and ninth uninterrupted generation, from parent to son; he was consoled because he had time to collect, although it was in the summer, scions of the trees which were sacrificed to afford a place for the erection of ovens;

but *public utility* had not yet exhausted all her severities against him. Unfortunately there was not a Chaptal in the council of the prince, and the engineer, seeing nothing, decided again in 1834, in the name of *public utility*, that Mr. Van Mons' nursery was the sole and only point on the globe, proper for the establishment of a gas-house for lightning the city. Heaven grant that these gentlemen may be enabled to see better for the future; but it is not in their power to prevent the true friends of intellectual light, and of public prosperity, from regarding their decision as an act of ignorance and the grossest vandalism.

Mr. Van Mons is actually seventy years of age; he has consecrated his whole, all his life, a larger part of his fortune to public utility, and yet it is the name of *public utility*, that they have slain him, assassinated him! O age of light, how dark thou art.

In the commencement of September, 1834, Mr. Van Mons, on sending me a box of pears which were the first of a seventh generation, observed in his letter, "when you taste these pears, the trees which bore them will no longer exist." In fact, I learned a few days after, that the destructive axe had prostrated these trees and many others, that the nursery was dishonored, lost, and Mr. Van Mons frustrated in his dearest hopes, which were to send us the products of his labor.

It is impossible to foresee, or rather I dare not express my fears as to what will become of the ruins of an establishment, which wanted encouragement, which was of a nature to elevate the glory of an empire.*

Note by Mr. Poiteau.

Count Lelieur of Ville-sur Ance, believes with Mr. Murinais and Mr. Bonnet, that the stock has an influence on the seeds of the graft. During his residence in North America, he saw in the environs of New York a red and a white peach which perpetuated their stone without variation; but when he had budded the red on the white and the white on the red, they neither produced fruit perfectly red, or perfectly white, the two colors were mingled.

FACT STATED OF REMARKABLE IMPROVEMENT IN LAND.

To the Editor of the Farmers' Register.

Amherst Co., *June 25th*, 1836.

As one of the advantages of your valuable journal consists in collecting the facts which may fall under individual observation, and thereby arranging the *data* on which to form correct opinions, permit me to communicate a fact which has fallen under my observation.

In 1832, in extending a clover lot, I included about three acres of a poor ridge, which I planted in the common corn field pea, for the purpose of clearing it of grass, &c. This crop scarcely returned me the seed. That fall it was sown in wheat, and in the following spring it was sown in clover and plastered. The crop of wheat was scarcely worth cutting, and the land was badly taken with clover: a sprig here and there seemed to struggle for a feeble existence. This clover was never fit to make hay, and hence was never cut; but it was grazed by calves each year. In the summer of 1835, this lot was fallowed and broken from 9 to 11 inches, and in October, sown in wheat: as the clover was too thin it was again sown in clover this spring, and the clover seed was harrowed in with a two-horse harrow with wooden teeth. The crop of wheat that is now on it is remarkably luxuriant, and most of it having fallen. Could this great improvement have proceeded from the deep fallow, or from the harrowing of the wheat this spring? It must have proceeded from one or both of these causes, as no other means have been used, except the plaster in the spring of 1833. The soil is a deep stiff red clay. This fact is communicated with the hope, that, by comparing it with the observations of others, it may assist in discovering the best and most efficient means of improving our land.

W. H. G.

GERMINATION OF WHEAT IN ICE.

To the Editor of the Farmers' Register.

Cumberland county,
June 23d, 1836.

I covered my ice last winter with straw containing much loose wheat. In the month of May the grains of wheat which happened to come in contact with ice, vegetated; and the roots extended into the body of the ice, from four to six inches, having a most beautiful white, thread-like appearance. The grain seems to have germinated after forming a bed in the ice: each grain was surrounded with a small quantity of water.

The stalk was bleached an inch above the surface of the ice, the top green and healthy. I make this communication without comment, and am now convinced that grain germinates at 32° of Fahrenheit scale, which has been denied by many.

WILLIAM B. SMITH.

GENERAL DIRECTIONS AND REMARKS WITH RESPECT TO MULBERRY AND SILK CULTURE.

Extract from the Silkworm.

The first step of the silkgrower is to prepare food for the worms; and the first in this operation is to select a proper location and soil, and to make choice of the kind of tree which is to produce the leaves.

The best location for any kind of mulberry to feed silkworms is on a moderate declivity facing the east or northeast—the worst exposure are to the south-west, the south or the west, because

The danger, if any, of their being winter killed arises from their growth being prolonged, and their substance remaining soft till late in autumn. The southwestern, southern and western exposures continue their growth later, because they are warmer than the eastern and northeastern, and the frost takes them before the wood is hardened. When the wood is matured there is no danger of winter killing.

The soil most suitable for the nursery is a moderately rich sandy loom, mellow, dry and friable. For the trees, when, transplanted for feeding, a dry, gravelly or somewhat sandy soil; better too poor than too rich; not that the trees will flourish better, but the leaves are more nutritious and healthy for the worms, and cause them to make better silk: no matter how stony if the trees can have room to grow

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* I have learned that Mr. Van Mons has been ordered to evacuate the whole of the land before the end of February.*

* As the above was written in 1834, the nursery must have been destroyed in 1835.—Translator.

The natural food for the worms are the leaves of the mulberry tree. There are several species and numerous varieties of the mulberry, the leaves of most, if not all of which are eaten by the silkworm; the most common are the black, the purple, the red and the white. The worms will feed on the first three, but the silk they produce is comparatively coarse. The white, or as it is frequently but improperly called, the Italian mulberry, is that on which worms have been hitherto chiefly fed, in Europe and in this country; but these now bid fair to be superseded by others recently imported from Asia, the chief of which are the Brusa and the Chinese, or *morus multicaulis.*

The Brusa is a hardy tree, far superior on account of the size of its leaves, to the White mulberry, but the Morus multicaulis, of which there have hitherto been some doubts respecting its hardiness, has now been fairly tested, and no reasonable question remains as to its taking place of all others. It is fully ascertained that it can be brought to feed a stock of worms in half the time of the White mulberry—that a given space of ground will produce from twice to four times the weight of foliage—and that a child can gather as much weight of leaves in a given time as two men, and that a given weight of leaves are worth a quarter more than those of the White mulberry: and besides all these advantages it is stated on respectable authority that it is more congenial to the health of the worms, and produces better silk.

The Chinese mulberry is at present chiefly propagated by layers and cuttings. The former mode is perhaps preferable for propagating on the same ground, the latter is best calculated for transportation. But little of the seed has yet been produced in this country, but will probably be plenty in a few years. When the trees are to be multiplied on the same ground by layers, they should be set so far apart as to leave room to extend the layers between them. When this is not intended, there should be room enough for them to produce their full growth of leaves without matting or choking each other. If the trees are set 19 8-10th inches apart, there will then be ten trees in a rod in each row, and when they get too large for that distance every other one can be taken up for sale or for transplanting, leaving five trees in a rod. The distance of the rows may be varied as fancy may dictate. If it is intended to pass between them with a cart or wagon, half a rod, or eight feet and six inches will be a convenient distance. To pass between them with a hand cart, the rows may be five feet six inches apart, which will give three rows to a rod. By the first plan, an acre will contain 3200 trees, and when every other one is taken out 1600. By the second plan the acre will contain 4800, and when thinned out 2400

The mode of preparing the ground, sowing the seed, setting cuttings and layers, will be found in the preceding numbers. For setting trees with roots, the best method is that proposed by Mr. Bestor which is given in the preceding number. If the business is commenced with the Chinese mulberry, most of the branches may be cut down in the fall, and separated into cuttings to set the next spring. The young shoots will produce leaves enough the first season to feed a small stock of worms, sufficient to procure eggs for the second season. By these few worms, a sufficient knowledge may be acquired to manage with a degree of safety the second year—when calculations may be made on some profit from the silk. The few worms fed the first year may be kept on rough boards covered with papers; but this is too slovenly a practice to be extended. Those who wish to proceed systematically, and who do not choose to build a cocoonery for the second year, are invited to call and examine the portable frame and hurdles which I have constructed, and which, if a little more expensive than rough boards and papers, will be found extremely convenient.

The plan of a cocoonery will be found in No. 7, which though it may be varied as fancy or convenience may suggest, will at least assist the constructer as a starting point from which to vary. But the general plan of feeding the worms on hurdles of net work, with some kind of slide under each to receive the refuse and filth, to be removed without disturbing the worms, will be found of indispensible necessity to any one who wishes to conduct the business with any regularity.

Various statements have been given of the quantity of silk which may be calculated on at different periods from the commencement, all of which are from good authority, founded on actual experiments. But as these experiments have been made by different people, the statements given of their results, as may be expected, differ also. As every person who goes into the business, will wish to form some estimate of what can be effected, to save my readers the trouble of searching the preceding numbers for data in scattered items, I will here give a statement, which, if the business is conducted with any degree of correctness, cannot be fallen short of.

I shall, in the first place, suppose the business to be commenced with the Chinese mulberry, and suppose an acre to be set with young trees or cuttings in rows five feet and six inches apart, or three rows in a rod, and nineteen and eight-tenth inches apart in the rows or 10 trees in a rod, giving of course 4800 trees. It has been ascertained that these young trees will yield half a pound of leaves each, the first season; but as I intend in this calculation, not to approach near the utmost limits, I will suppose them to afford only a few leaves to feed the small stock of worms necessary for eggs for the next season, which need not be over one thousand. I shall suppose only half a pound of leaves from each tree the second year, though it has been ascertained that they will yield a pound. I suppose the third year every other tree to be transplanted out, which will leave 2500 trees, from each of which I calculate a pound and a half of leaves this year, three pounds the fourth year, five pounds the fifth year, and seven pounds the sixth year.

It has been stated by some experienced feeders of silkworms, that 80 pounds of Chinese mulberry leaves will produce a pound of silk: the account, then, for six years, will stand thus.

Years.	*Trees.*	*Quantity of leaves each.*	*No. worms.*	*Quanty of silk.*
1st	4800			none.
2d	4800	8 ounces.	72,000	30 lbs.
3d	2400	1½ pounds.	108,000	45 do.
4th	2400	3 do.	216,000	90 do.
5th	2400	5 do.	288,000	120 do.
6th	2400	7 do.	264,000	210 do.

If the rows of trees are set 8 feet 3 inches apart, giving two rows to a rod, the quantity of leaves, worms and silk will consequently be one third less. All the difference in advantage will be, that by the latter mode possibly a little labor may be saved by collecting the leaves in a cart or wagon drawn by a horse, and in the former they will be taken in a hand cart or in baskets.

Respecting the white mulberry, the reports from full grown trees average from forty to sixty pounds of silk, and this not till twenty years old. Who then will depend on the white mulberry to feed silkworms, and wait 20 years to obtain forty to sixty pounds of silk to an acre, when the Chinese will yield profit the second year, and 200 pounds or over in six years.

As there are several varieties of breeds of the silkworm, it will be of importance in procuring the eggs, to select and sort them, so as not to have two kinds together; not only on account of having them hatch and pass through their various changes at the same time, but also to have the silk they produce of uniform quality, as that produced by different parcels of worms often varies in color, in fineness, and indeed in all its qualities. Respecting the choice of any particular variety, it would be impossible to give, in the present state of knowledge of the subject, any decided preference, provided they are kept separate.

There is another part of the subject which has yet to be decided by farther experience, and that is the question whether it is best to confine the business to one crop, or to extend it several in a season. There are some worms which complete their whole course of operations in about four weeks, and others which require six. But even with the six-weeks worms there will be sufficient time during the summer in any part of the United States to produce two crops. The only advice I shall venture to give in this case, is the same I have given in former cases, to proceed sparingly and cautiously in all new operations. On that ground, I should judge it most expedient to begin with one crop at first, and when experience shall have rendered the business familiar, the young silkgrower will be enabled to make his own calculations.

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TO PROMOTE THE EARLY BEARING OF THE APPLE AND PEAR.

John Williams planted seed in pots, in November, 1809, transplanted after midsummer in the following year, into the open ground—transplanted again in the autumn of 1811, six feet apart—pruned away every winter the trifling lateral shoots, leaving the larger laterals at their full length to the bottom of the plants, and gave a good exposure to the sun. At the height of six feet the branches ceased to produce thorns. One yielded fruit at four years old, and several at five and six years.—(*Rep of Arts*, 1819, *p.* 175.) Repeated transplanting retards the growth of wood, and induces premature maturity in the plant—it converts, for want of abundant nourishment, wood buds into fruit buds. It is calculated to produce early bearing, but not to produce stately long lived trees. Precocity in vegetables, as in animals, is rather indicative of short life. Frequently transplanting is often resorted to by the florist, in order to induce plants to produce double flowers, or to produce an abundance of flowers, and it is found highly efficacious in the balsam, coxcomb, &c. It deranges the natural organization of plants, and produces *monsters*, a term applied by botanists to double flowers. It is by a process like the one pursued by Williams, that Knight so early obtains fruit from seeds, the blossoms of which he fecundates artificially, and it is to this that we are probably indebted for many of the fine fruits that enrich our tables, and for many of the gay flowers that embellish our gardens.

From the Farmer and Mechanic.

VEGETABLE DYES.

There is a species of lichen, growing on trees, of a greenish color, which the country people gather, under the name of moss, which dyes a permanent orange color on wool. It may be gathered by bushels from the oak trees, hanging in bunches from the limbs. Lie or potash, we believe, is used to fix the color. The acrid herb called smart weed, or biting knot grass, is said also to dye a brilliant and unfading yellow. If these dyes are unknown to chemists, we think they ought not to be; and the scientific should not under-value an important principle, which their science may render five times more valuable, merely because they owe the discovery of it to the ignorant.

RULE FOR DETERMINING THE WEIGHT OF HAY.

Hay in the field rick, says Low, weighs somewhat better than 112 lbs, the cubic yard; after being compressed in the stack, it weighs from 140 to 180 lbs., and when old, 200 lbs.

From Paxton's London Horticultural Register.

ON THE TENDENCY OF PLANTS TO REPRODUCE THEMSELVES.

It is a general law of nature obtaining in both the animal and vegetable kingdoms, that, in order to perpetuate the species, each individual or pair of individuals, are so constituted, that by a union of their powers respectively, progeny is produced.

It is remarkable that in both those kingdoms the manner of production is similar. The eggs of animals are very similar to the seeds of plants; and the bulbs, and tubers, and suckers of plants bear a strong resemblance to the viviparous young of animals. Increase by division also obtains in both: the dividing of the polypi is exactly like the production and separation of the sporules of fungi and other inferior orders of plants.

But vegetables are endowed with greater powers of re-production than animals. The latter have only one manner of re-production, from which there can be no departure. Oviparous animals cannot bring forth young viviparously (except in a few instances among insects,) nor *vice versa*. Whereas among plants we find many that can re-produce themselves in three different ways, namely, by seeds, by offsets, or by suckers; and what is very remakable in such cases, is that whichever of these take the lead in productiveness, the other two are neutralized or nearly so; and this versatility of character may be made so subservient to the purposes of the manager, that he may have whichever of the three he may choose. If offsets be wanted from a bulb or tuber, or from a fibrous rooted plant, the flower stems must be cut off; and if seeds be the object, then every new offset or tuber should be displaced as soon as it makes its appearance.

We have been led to make these remarks from having observed (the first time in our life) in the Chelsea Botanical Garden, the flowers of the Jerusalem Artichoke (Helianthus tuberosus) nearly expanded. This is a circumstance which but rarely occurs in this country, owing, no doubt, to these plants being cultivated in rich soil, which induces the production of tubers rather than flowers.

But this last summer has been remarkable for its great heat and long continued drought, and consequently, the soil being exhausted of that degree of moisture necessary to the production of tubers, and extraordinary effort has been made by the plants to reproduce themselves by seeds, and which is quite conformable to the general law of vegetable developement, as instanced in other similar cases.

The ingenious T. A. Knight, Esq., S. H. Society, has founded a rule in practice on this very circumstance, as applicable to the potato. The greater number of the varieties of this useful plant re-produce themselves by both seeds and tubers at the same time. But it forcibly struck the inquiring mind of that gentleman that no plant can produce both in such quantity or perfection as, one of them only. And he also knew that, by defructifying the top, additional energy would be given to the underground offspring. This was sound philosophy; and the results of manifold trials have been to confirm his doctrine.

On the same principle, other practical experiments are based. Both Dutch and other florists not only prevent their budding bulbs from flowering, but mutilate by cutting off the upper half of their bulbs, to cause an extra ejection of offsets. And our own exotic plant growers find it difficult to propagate some of the African bulbs without having recourse to the same manœuvre.

There are several other plants which show this property of re-production by other than the ordinary modes. Wheat, which is either an annual or biennial according to the time of the year at which it is sown, will, if repeatedly eaten or cut down, continue to produce side shoots, and ripen seed in the third year. The strawberry, if divested of its first flowers, will produce others and yield fruit in the autumn. A filbert tree, surrounded by a great number of suckers, seldom bears many nuts. Horse radish, whose growth is chiefly towards enlarging the root, seldom flowers or bears seeds; and many other similar instances may be adduced.

The knowledge of this power or faculty of plants is necessary to the practitioner, whether in gardening or farming. The first by directing the vigor to the useful members of the plant, may have them in greater perfection; and the second, by mowing his thin crops of grass early in the season, will much sooner obtain a thicker sward.

Extracts from the Journal of the Franklin Institute.

PATENTS FOR AGRICULTURAL IMPLEMENTS, &c., ISSUED IN NOVEMBER, 1835.

With remarks, by the Editor of the Journal of the Franklin Institute.

For a *Machine for cutting Straw*, &c.; Henry C. Jones, Salem, Warren county, Ohio, Nov. 7.

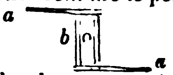
There is nothing in this cutting machine to distinguish it from a score or two of others, and of this the patentee seems to be aware, as he says that "this machine is operated somewhat similar to other straw cutting machines;" after which he proceeds to claim certain things which are of little or no importance, and some of them, withal, not new.

For a *Conical Arch Charcoal Burner;* Ezra B. Gilbert, Ephratah, Montgomery county, New York, November 7.

The claim made is to the before described conical arch charcoal burner, for manufacturing charcoal. Excepting in shape, we do not see in what particular this kiln differs from that patented by Mr. Doolittle, in 1829, and described by him in the seventeenth volume of Silliman's Journal, p. 396. We have long had by us a model of a charcoal kiln, exactly in the shape of that now patented. The person who sent it proposed obtaining a patent, but declined doing so when informed that there was not any thing new in the principle of it, or in his mode of application.

For an improvement in the *Horse Rake;* James Pudney, Stanford, Delaware county, N. York, November 7.

Two bars, each about seven feet long, are to have rake teeth fixed into them, at suitable distances apart, and about two feet long. These two bars are to be framed together by timbers at their ends, so that the two bars may be about two and a half, or three feet apart. The teeth are to point in opposite directions, thus,



where *a a* shows the points of the teeth, *o* and *b*, the timbers by which the two rake heads are framed together. When the rake is drawn forward, one set of points is on the ground, the others serving as handles, by which to guide it. When the rake is full, the upper ones are pushed forward by the person who guides it, and the rake rolls over, depositing the straw, grain, &c. The horse is geared to a frame, allowing of this rolling over, which frame is attached to the rake by headed pins, that pass through a slot in the timbers, *b*, which are double.

The claim is to the manner of using two heads, or rakes, and the self-adjusting slide, or groove, as the ends of the head bars.

For a *Machine for Cutting Straw;* Ashman Hall, Kent, Putnam county, New York, Nov. 7.

There is to be an angular knife, something like an inverted V, and this forms one of the claims; a claim is made, also, to a board, which is to gauge the length of the straw, and, lastly, to a spring to raise the sliding board; the angular knife is not new, and boards for gauging have been often used in a similar way.

For a *Grist Mill;* Philip Hauser, Cincinnati, Ohio. An alien, who has resided two years in the United States; November 7.

The grinding part of this mill consists of a common conical shell and nut, like those of the ordinary coffee-mill, without a single feature of novelty either in form or substance. The claim is to "the general arrangement and combination, but not to the parts, taken separately." It is one among those gross pretensions at invention which would excite much surprise, were they little more rare.

For a *Smut Machine;* John Tuck, Columbus, Pennsylvania, November 7.

There is a stationary cylinder of sheet-iron standing on a suitable frame, its axis being inclined at an angle of about ten degrees with the horizon. Within this cylinder there is a second, which is made to revolve, the two being about three-fourths of an inch apart. They are both punched, grater fashion, their rough surfaces being towards each other. Within the inner cylinder there is a revolving fan wheel, extending its whole length. The grain is fed in at the upper end, between the two cylinders; the revolving of the inner one rubs the grain, whilst the wind from the fan, blowing through the apertures, discharges it, together with the cheat and cockle, the openings in the outer cylinder being made large enough for that purpose. The claim is to the machine generally, and "particularly to the shaft and spirally arranged wings for causing a current of air within the revolving drum."

For *Preparing Extracts of Bark for Tanning;* Otis Batchelder, Bedford Hillsborough county, North Carolina, November 7.

The following is the recipe: "Put such quantity of the extract of the bark into the vat as may be required; then put upon the extract, vinegar, or some other acid, in the proportion of about two gallons of vinegar to the hundred weight of the extract; after that, put on water, cold or warm, in sufficient quantity to cover the extract; then pulverize and mix well, and then add such quantity of water as may be necessary, and the liquor is fit for use. What he claims as his improvement, is the method of dissolving in cold or warm water, with the addition of acid, instead of boiling, as has been heretofore done."

For a *Revolving Screen for Cleaning Grain;* Edward P. Fitzpatrick, Mount Morris, Livingston county, New York. An alien, who has resided two years in the United States; November 14.

Instead of using woven wire, in meshes, as is usually done, the screen is to have wires running straight along it; of these there are to be several sections in the length of the screen, each section extending from one rim to another, which is fastened upon the axle for that purpose. The screen is to be inclined, and the grain fed in at the upper end, in the usual way; the wires in the first section are to be so close together as to allow only dust to pass; the next is to allow cheat to escape; the next small wheat, and the last large wheat. Between the last it is proposed to form the cylinder of sheet metal, instead of wire, and to punch it full of smooth round holes, large enough for the discharge of cockle.

The claim is to the placing of rods, or wires, lengthwise of the cylinder, from one groove circle to the other, at suitable distances apart for cleaning grain; instead of woven coverings, with numerous openings.

For an improvement in the *Smut Machine;* Edward B. Fitzpatrick, Mount Morris, Livingston county, New York, November 14.

This smut machine is to consist of an outer stationary cylinder, standing vertically, its periphery, being formed of longitudinal rods or wires, placed so close together that grain will not pass between them, whilst the dust from the smut will escape readily. Within this there are to be revolving beaters formed by extending square iron rods from one set of cross arms on the lower end of a revolving shaft, within the cylinder, to other similar cross bars near the upper end of the shaft, and close within the heads of the cylinder; these rods are to be made ragged at their edges, and placed near together on cross arms, extending from the shaft to the periphery of the cylinder. They are not to run directly along with the cylinder, but spirally, just as they would stand supposing them to be put in straight at first, and one of the sets of cross arms to be then turned half way round, thus giving a spiral direction to the rods.

The grain is to be fed in through the upper head of the cylinder, and to escape through an opening in the bottom head; but in passing down it is driven forcibly about by encountering the spiral beaters, the shaft of which revolves with great rapidity, and by this means, it is said, the smut is effectually removed.

The claim is to the above described manner of constructing a smut machine.

For a *Cheese Press;* William C. Greenleaf, Andover, Oxford county, Maine November 23.

A follower is to be forced down by a toggle joint, the pressure being continued by hanging a weight to a lever, or arm, attached to the joint. The patentee says, "I do not claim the original invention of the toggle joint, but I do not claim as my invention its application to the purpose of pressing cheese." Independently of the toggle joint having been previously used for the purpose, such a claim we esteem as altogether worthless, for if a claim to the "application" is valid, there may be as many patents for one press as there are articles to be pressed. The law grants patents for any "new machine."

For a *Mortising Machine;* John M'Bride Richmond, Wayne county, Indiana, November 26.

In this machine, the chisel is made to advance upon the piece to be mortised, instead of causing the piece to move under the chisel. The chisel is to be acted upon by two compound levers, one of which is to be moved up and down by the hand. The fulcrum of the lever to which the chisel is attached, is on a kind of slide, which is caused to progress forward by a pall falling into a rack. The precise way in which this is effected is not clearly shown, and, indeed, there is considerable obscurity in the description of the machine in general, so that a workman could not undertake to make it from the information furnished. The claims would not serve to convey any definite idea of the things which are the subjects of them.

For an improvement on *Tub Water Wheels;* Edward Newnam, Hendricks county, Indiana, November 26.

This is a poor contrivance, poorly described, and as poorly represented. The design, however, appears to be to double the power of the water, by letting it on at opposite sides of the wheel. The affair is without a claim, and is not worth one.

For *Hulling and Cleaning Cotton, and other, Seeds;* John Ambler, Jr., city of Philadelphia, November 26. (See Specification.)

For an improvement in the *Hydrant;* Sater F. Walker, city of Baltimore, November 26.

The claim under this patent is to "the mode described of constructing and using the ascending tube, so as to discharge the waste water at pleasure, either above or below the surface of the ground; the mode of preserving the distance between the valve seat and screwed nut at the top; and the making a waste cock of metal with a wooden key, and leather interposed." It would require considerable space to explain the arrangements referred to, and as we understand that Mr. Walker is about to apply for a new patent for certain modifications of this apparatus, we shall wait until these come under our notice.

For an improvement in *Grist Mills;* Samuel Hyde, Malone, Franklin county, New York, November 30.

This appears to be intended for a portable mill, although no dimensions are given. Both stones are to revolve in the same direction, the lower with a slow, the upper with a rapid motion. The lower stone is fixed upon a hollow shaft, and the upper upon a spindle which passes through it. The shaft of the lower stone runs upon "bead rollers," that is, upon round balls retained in a groove. The gearing we shall not attempt to describe, as this might be varied by any competent workman. The running both stones in the same direction, with different velocities, is claimed, and for aught we know, this claim may be sustained; but we are uninformed respecting, and cannot perceive, any advantage which can result from this construction, whilst it is open to the objection of complexity. The "bead rollers," at the bottom of the exterior shaft, are claimed, but they have repeatedly been applied to shafts, although soon abandoned, as they are theoretically and practically bad.

For an instrument for *Cutting Wood;* John Ruthven, city of New York. An alien, who has declared his intention to become a citizen; November 30.

This instrument is to be used as a substitute for mill, cross-cut, circular, and other saws. The cutting part consists of two steel edges, which are to operate like a paring chisel, taking off a narrow shaving, instead of tearing the wood by numerous points. A mortise is to be made on the edge of a blade, such a blade, for example, as would be fixed in a frame, in the place of a mill saw; and in this the cutters are to be secured, one edge pointed in either direction, so that the cutting may be effected both by the up and down strokes, the feed of the log, in this case taking place at the termination of each stroke. In the circular saw, the cutters will, of couse, all stand in the same direction, and the feed, we suppose, will be continuous.

When used for cross cutting, there are to be additional lateral cutters, to cut across the grain, like the fore iron in a cut-and-thrust, or a plane for cutting grooves across boards.

The claim made is to "the instruments described, and the method of cutting wood by them."

We very much doubt the general applicability of this method of cutting wood, instead of sawing it; a good mill saw may be fed half an inch at each stroke, whilst cutters, such as those described, cannot be allowed to cut more than an eighth of an inch, making a quarter in the double stroke. There will be a difficulty, also, in holding down the log in the up stroke, and the stuff will *spole* when the cutters arrive at the edges of the boards. The kerf, also, we apprehend, must be made thicker than with a good saw. The cross cutting appears to present other objections, which, with those already enumerated, we shall be glad to hear have been practically dissipated.

For a *Kiln for Drying Grain;* Thomas Crook, New Hope, Bucks county, Pennsylvania, November 30.

This patent is taken for an improvement upon a kiln for the same purpose, patented by Benjamin Parry, in the year 1810. In this kiln, it appears that the grain was fed into an inclined pan, contained in a chamber heated by a furnace and flues, the pan being agitated by a roller to cause the grain to descend regularly along it. The present patentee uses two pans, one above the other, and inclined in reverse directions, the grain falling from the first into the second; he suspends his pans by chains, and agitates them by a roller in a more convenient manner than heretofore. The claims made are to "the manner of arranging a second pan under the first, for the purpose described. The manner of strengthening the pans, as above, and the method of supporting them at the outside, by swing chains, instead of a roller."

For a Machine for *Cutting Straw;* John Wirt, Evansham, Wythe county, Virginia, November 30.

The whole of this apparatus is confessedly old, with the exception of "a cog wheel on the shaft of the cutting and fly wheel, working in the teeth of the crown wheel, on the end of the lower feeding roller, for feeding the machine." The same purpose has been effected by similar means, and that forty years since.

ON THE ECHELON CULTIVATOR AND EXPANDING HARROW.

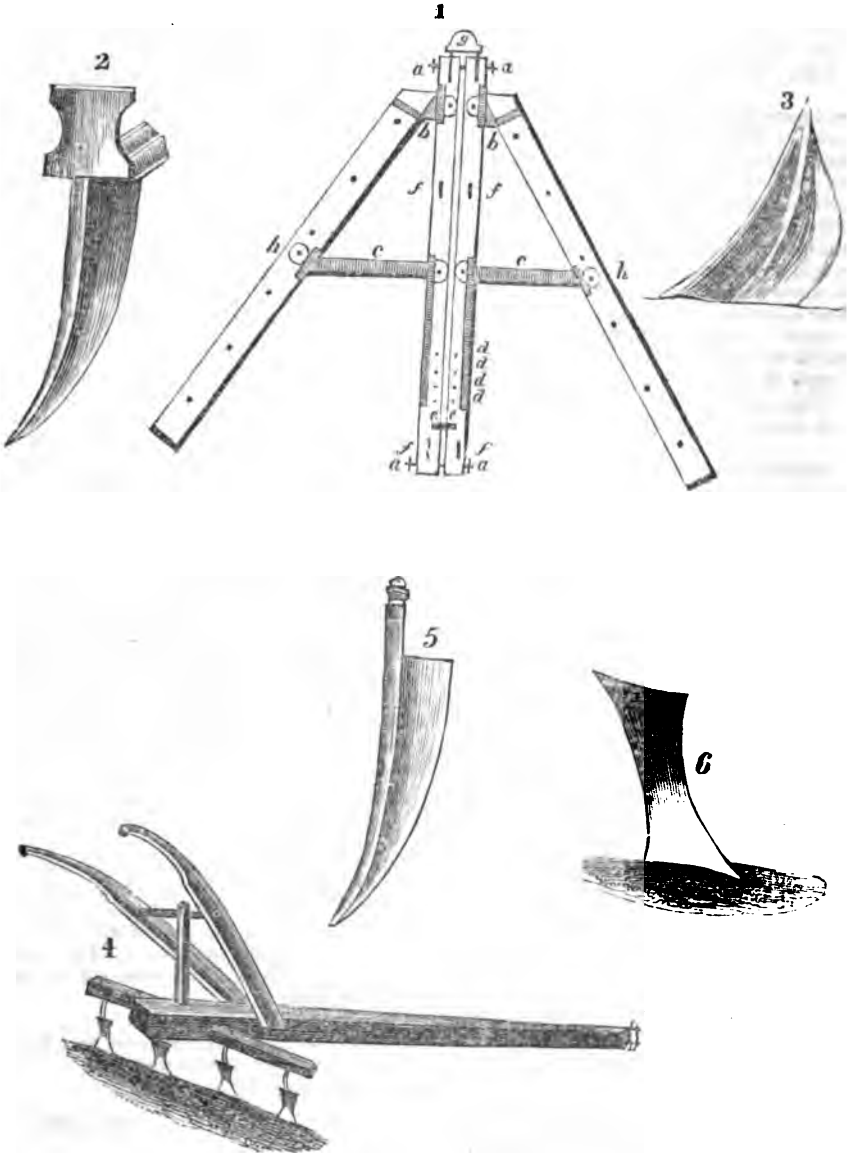
To the Editor of the Farmers' Register.

April 22d, 1836.

I now send you the long promised drawings of my Expanding Harrow and Echelon Cultivator.

The delay has been caused by my wish to give both a fair trial before I made any public communication for your journal in regard to them. But as yet, I have only been able to do it with the cultivator: for the supply of intelligent workmen falls so far short of the demand for them, in my part of the country, that I could not get any of the harrows made in time for corn planting. A more minute description, therefore, of their operation, must be postponed for another opportunity.

In recommendation of the Echelon cultivator, although it *is* my own contrivance, I think I may venture to assert that, wherever the soil is tolerably friable, and free from stumps, roots, and stones, having first been broken up, as usual, with a double plough, this implement will certainly save at least half the time and labor of after culture. Moreover, it may be set to run as deep as single ploughs commonly do: it will answer equally well too for cultivating any crop, the rows of which are wide enough for its passing to and fro between every two: it will throw the earth either to or from them, according as you turn the right or left end of the diagonal bar next to them; and in clean land, it will cover small grain effectually, in half the time of a single plough, and at a more uniform depth. Another advantage in using it is, that the only irons about it which are exposed to be worn out by the soil, are the cast iron points, and these admit of being twice worked, by turning end for end, before new ones are required.



Scale half an inch to the foot.

References to the figures. No. 1., the expanding harrow, here represented at its greatest expansion of 5½ feet. *a*, *a*, *a*, *a*, Eye-bolts to hold together the two middle pieces, which are rounded on the inside, to admit of the side pieces rising or sinking with the inequality of the surface. *b*, *b*, Iron tenons passing through the middle pieces, and playing on pins to admit the contraction of the side pieces. *c*, *c*, Small iron bars also playing on the pins *h*, *h*. By moving the inner ends of these bars to the holes *d*, *d*, *d*, *d* four contractions are effected, each less by 6 inches than the proceeding. *e*, *e*, Head of the central iron No. 2, which is so fixed as not to hinder the rising and sinking of the middle pieces of the harrow. *f*, *f*, *f*, *f*, Mortices for the handles. *g*, Coupling iron for the 2 clevaces.

No. 3, cast iron to fasten on No. 2 by means of the dove-tail groove behind. This, when the first point is worn out, affords a fresh point by being reversed; but is not large enough for opening the furrows to plant corn. To effect this, I intend to use a cast iron formed something like Sinclair's double mould-board plough, having also a dove-tail groove behind, to fit the same iron No. 2. The form, I presume, will readily be understood without a drawing.

No. 4. This represents the Echelon Cultivator; No. 5, the wrought irons fastened in the diagonal bar, and No. 6, the cast irons, each of which has 2 dove-tail grooves in the under surface, by means of which the points may be reversed. I must apologize for this drawing, as the teeth or cultivating irons have not the proper draft, or pitch, (I know not which to call it,) and the lower end of the handles ought to be represented as being fastened together by one staple on the upper surface of the beam.

Permit me, while writing of my own inventions, or improvements of agricultural implements, to say a word or two in favor of one, which, although long in use near Richmond, wherein it is made, was not known until 12 or 18 months ago, even to myself, whom many of my acquaintances accuse of being somewhat hobby-horsical on this subject. I mean the corn-sheller of Mr. Jabez Parker, machinist, whose manufactory of agricultural machines and implements is on the Main street, in Richmond, the next house below the Union tavern. There is abundant certified proof, in addition to my own experiments with this very valuable implement in a corn-growing country, to satisfy even one of Dr. Doubty's breed, that it will shell out ten barrels of corn per hour, if the grain be dry and perfect. It requires only two hands, of medium strength, to turn it with perfect ease; one to feed; one occasionally to haul away the cobs, which pass out unbroken and apart from the grain, (the two last mentioned hands to spell the two first at distant intervals,) and two or three of the youngest hands to supply the corn when near at hand; and it occupies little more space than a cutting box; of which, (by the way,) Mr. Parker sells *one* that will pay any purchaser much more than compound interest on the first cost. His corn-sheller, if geared to a wheat machine, has been certified to shell out at least one hundred and eighty barrels per day. The only possible objection I can see to it is, that a small portion of the grains of corn will be cut, unless they be of the hard, flinty varieties. This would be no objection where the corn was soon to be ground; nor can I see why it should be so when it is shipped, unless for a long voyage. In a word, it is the best corn-sheller, among six or eight varieties, that I have ever seen; and I take this occasion to recommend it, not only in the hope of encouraging a worthy man, highly useful to agriculturists, but of stimulating our brethren to exert themselves more than they ever have done, in searching out and examining for themselves the numerous agricultural machines and implements invented or improved by the mechanical genius of our countrymen, and whose great utility is thoroughly established with all who have tried them, although utterly unknown, probably, to three-fourths of our profession. This is the case, not only in regard to Mr. Parker's corn-sheller and cutting-box, but likewise with Fox & Borland's very superior portable wheat machine, also made by him, with a much improved horse power, which, I believe, is not made by any machinist in Virginia but himself.

The truth is, and it ought not to be concealed, nay, it should be exhibited in its strongest colors, that, in regard to all such matters, we Virginia planters and farmers too much resemble the inhabitants of a country called "*Lubber-land*," described by a writer in that excellent periodical "The World." These he represents as laying on their backs with their mouths wide open, expecting it to rain fat pigs ready roasted for their special use. Now, although *laziness* cannot be justly charged upon us as a characteristic vice, yet the *good-enough-palsy*, (if I may call a very old disease by a new name,) prevails, I believe, more among our order, than in all the other orders of society put together. Its invariable "diagnosis," as the doctors would say, is an utter contempt, manifested by looks, words and actions, for every imaginable thing called a *discovery* or *invention*. Its effects are perfectly congenial, and flow necessarily from their parent cause; for they preserve all upon whom they operate—all stultified by their paralytic influence, in a situation which an old Quaker friend of mine, formerly in Congress, used to call "*the state of statu quo*. To use an old adage, they are "*gum against thunder*;" and although surrounded by agricultural neighbors who have long judiciously availed themselves of every new thing really beneficial to themselves and their profession, these ineffably self-satisfied planters and farmers, triumphantly persist in believing that "the grand march of mind," *quoad* agriculture, had reached its "*ne plus ultra*" in the days of their fathers, and of course, that any departure, however small, from the course which *they and their fathers and grandfathers* had pursued, would be downright rebellion against supreme ancestral authority.

Believing you to be somewhat of a radical in such matters, I venture to address these remarks to you, with a request that you will indite us a homily upon the *good-enough-palsy*. If you will take the assurance of a friend who has never been a flatterer of any man, however idolized, you are able to do it with some effect; nay, if persuasion, and coaxing, and wheedling will not do, I know that you have caloric enough to clap the coal of fire, (if nothing else will answer,) on the backs of our terrapin agriculturists, that, when forced to poke their heads out of their shells, they may have at least *a chance* of hearing something for their own benefit. It will be, I confess, rather a discouraging, if not a perilous undertaking; for many of them are testy and combative, as well as bigotted, and consequently obstinate; but I believe you have both the personal and moral courage suited to the occasion, and, at the same time, a willingness to receive aid, even from the most feeble of your true and sincere friends. Let me add, therefore, that, if "clapping on the back" by a willing coadjutor in this vital cause, can be of any service to you in making battle for it, you have only to call for such service, and it shall be, at all times, most cheerfully rendered without regard to personal consequences, by

Your old personal, political and
agricultural friend,
JAMES M. GARNETT.

For the Farmers' Register.

FERTILIZING EFFECTS OF CLOVER.

In 1835, S. M., in the county of Campbell, made 14 2-5 barrels (72 bushels) of corn to the acre on land, a hill side, which had been improved only by clover and plaster.

The seed was sown in 1832, and the clover, without being mowed or grazed, was permitted to rot on the ground three years. The owner thinks the product would have been larger if the corn had been planted closer, and that the crop would not have *exceeded* five barrels, before the clover was sown.

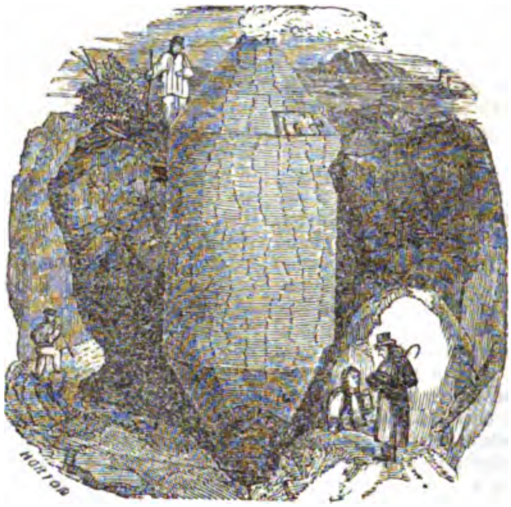
M. D.

MINERAL MANURES.

Extract from No. 46 of the *Farmer's Series* of the *Library of Useful Knowledge* first published in London, Nov. 15, 1833.

Lime Kilns.

The calcination of lime is an operation so generally understood in every part of the country where it is commonly found, that it scarcely requires to be described. Its effective burning is however a point of some difficulty, and the construction of kilns has occasioned much discussion. They possess various degrees of merits, but their description would occupy more space than can be afforded to the subject in the limits of this publication. We however extract the account of one designed several years ago by the late Bishop of Clogher—or, as other accounts say, by Mr. Rawson, of Cardington, in the county of Kildare[*]—which has since extended to several other parts of Ireland, where it has been found of the most essential service in the improvement of the moors and bogs, and is so simple as to deserve to be more generally known.



It is partly an inverted cone, and partly a cylinder, of which the annexed cut will afford an elevation.

The dimensions of the conical part are 8 feet high, and the diameter at bottom about 18 inches; the cylindrical part of the same height as the cone; making altogether 16 feet; though it is observed by the reporter that 20 feet in height—namely, 11 for the cylinder and 9 for the cone—would be preferable. The diameter of the cylinder, and of course also the largest diameter of the cone, is 8 feet. The kiln is to be fed through an iron door, and, when filled, should be shut close: a metal plate with holes, or a close grating, is placed at the bottom to give air to the fire, and two flues should be carried through the wall at about 8 feet from the eye of the kiln, in order to add to its force. It is also recommended that an outside wall be slightly raised at such a distance as that about a couple of feet of yellow clay may be closely packed between it and the inner one, as a precaution against its splitting, and the fire thus becoming exhausted. The fuel used is turf, and, when well attended by a couple of men and a boy, will turn out about 50 barrels of roche-lime in the twenty-four hours.[†] This kiln, together with an attached four hours.* This kiln, together with an attached lime-house of 40 feet by 20, with walls 14 feet high, and a slated roof, only cost 60 guineas at the time it was erected. It would now probably cost considerably more; but still, when divided amongst a number of even middling farmers, the benefit which they might derive by its use would be considerable; for they appear to pay dearly at present for lime, and the sorry *pot-kilns* by which it is manufactured are so badly managed, that the use of it as a manure, though limestone is plentiful throughout the country, is yet upon a comparatively limited scale. Added to this, it has been broadly asserted, as a complaint that is not uncommon in England, that the professed lime-burners have their bushel measures made of basket, which, as soon as they wear away at the rim, annually diminish in size; so that carriages that formerly were known to contain only a certain measure, now carry considerably more.†

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[*] Surveys of Tyrone, p. 113; and of Cavan, p. 68. See also a Prize Essay on the Construction of Lime-kilns, by Mr. Menteath, of Closeburn, in the Transactions of the Highland Society of Scotland, N. S., vol. ii. p. 127; and various remarks upon the construction of kilns, with explanatory engravings, in Malcolm's Comp. of Mod. Husb., vol. pp. 58—73.

Although a kiln, such as that described, is comparatively cheap, yet there are many parts of the kingdom where the consumption of lime is not sufficient to induce the erection of permanent works by dealers, notwithstanding its use might be very advantageous, especially in bringing waste land into a state of cultivation. Even where coal is not found, yet, as such soils generally abound with peat, lime may be economically burnt upon the land wherever there is limestone within a convenient distance; of which an account has been lately published by Mr. Wallace, of Wigton, from which we extract the following particulars.

If peat be used, it should be first pared and dried. The site on which this substitute for a regular kiln is to be formed should be circular—say five or six yards in diameter: the soil should be dug up from off the subsoil; and then the operation of burning is to be performed in the following manner:—In the bottom of the pit lay a large quantity of furze, heath, or ling, upon which place about 2 feet in thickness of the parings, in the centre of which begin to form a funnel, or flue, of furze, encircled by peats, and around this lay about 6 or 8 inches deep of limestone, broken in small pieces. Then carry the flue up a couple of feet higher than the limestone, adding afterwards another layer of furze and parings about one foot deep, and then limestone, layer after layer of each, but still continuing the funnel; observing, however, that the circumference of each layer is to be lessened, until the whole assumes the form of a cone, or sugar-loaf, with the flue for its apex, or point. When this is done, brushwood, furze, heath, or any combustible matter, must be piled around, with peats to keep all together; and if the soil contain clay, clods may be added. Then set fire to the furze at the top or point of the flue, and the whole heap will burn down to the bottom with such effect, that within twenty-four hours the limestone will be completely calcined. If clay be added, it will also become sufficiently hardened to be easily reduced to powder, in which state, as we shall hereafter see, it may be converted to valuable manure; and the ashes may also be used as a dressing.* This method of burning lime has also the further advantage, that these pits may be dug on every part of the land where it may be wanted, as they may be filled up with the soil previously taken out of them; or if it be also an object to burn clay, the operation can be performed at the same time, and a great portion of the expense may thus be saved.

The kilns employed for agricultural purposes in this country, are generally placed against a high bank for the greater convenience of charging. They are mostly built with brick, but are commonly so ill constructed that they allow a great portion of the heat to be lost, consequently occasioning the loss of a great quantity of fuel—which usually consists of faggots and furze—and burning the lime imperfectly. There is, however, an economical mode of burning lime in stone-pits—or *pye-kilns*, as they are in some places called—detailed in the Survey of Derbyshire. It is in use by some farmers solely for their own land, but care is requisite when the process is performed by unpractised persons, as lime—particularly of the hot sorts—if burnt with too violent a fire, is apt to melt and run together, in which state it will not slake, and becomes useless, or what is termed *over-burnt*, and, in some places, *dead-lime*.† The fuel there used is coals; and it is calculated that about 25 tons will make 2400 bushels of good lime.

Compost.

Independently of the mixture of lime with the soil in the manner already stated, great advantage may also be gained by making a *compost of lime and earth*, which has been found to possess more fertilizing properties than when it has been laid naked upon the land; and a far less quantity is found to answer the purpose. The great objection raised by most farmers, is the heavy expense of labor, and also cartage, which is, in many situations, so great as to prevent the operation. It should, however, be observed that the compost is, in many cases, chiefly composed of the scourings of ditches, and of pond-mud, in which instances the charge of labor must necessarily be incurred, and a great portion of the cost is thus saved. Another mode of reducing the expense, is also to plough up the headlands of fields in which the compost is intended to be laid. This is effected by ploughing the land as deeply as it will admit; and if the subsoil be not of such a quality as to occasion sterility, this mixture of fresh earth along with the surface-soil and lime, will prove highly advantageous. Virgin earth, indeed, if not in itself a manure, readily unites with lime, and richer composts are thus made, than with earth taken from the surface: the expense, too, is less, for a smaller quantity of lime can be made to answer the purpose. The lime should then be laid on in the state of shells, before it is slaked, and ploughed well in, to ensure its complete combination; the loose earth which escapes from the side furrows should then be shovelled up and thrown over the heap, after which a fermentation takes place within a very short time, if the weather be damp and warm; and the compost should be immediately laid upon the land, in quantity according to the quality of the soil to which it is to be applied. From 40 to 50 double cart-loads have been found a full dose to ordinary land, of which only one-seventh part of the compost was quicklime, which was considered equal in force to one-third of that which had been slaked. Nothing, however, can be more uncertain than the quantity of lime required, for it depends both upon the quality of the lime and of the earth with which it is to be mixed, as well as the state of the weather; but, from trials which have been frequently made, it would seem that two bushels of lime-shells will be sufficient for a cubic yard of earth of average quality; and 64 cubical yards of the compost—when properly prepared and applied to the soil—may be deemed a moderate dose for an acre of land; indeed, 40 have been considered a good dressing for light land, though more might unquestionably be, in most cases, laid on with better effect.* A dressing of this kind has been frequently found more effectual than one of farm-yard dung, which has been proved by such numberless experiments, that it is only necessary to mention the following:

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* It is said 'that limestone can be burnt to better purpose, and at less expense, with peat, or turf, than with coal. When coal is used, the limestones are apt, from excessive heat, to run into a solid lump, which never happens with peat, as it keeps them in an open state and admits the air freely. The process of burning, also, goes on more slowly with coal. No lime can be drawn for two or three days; whereas, with peat, it may be drawn within twelve hours after the fire is put to the kiln; and in every succeeding day, nearly double the quantity of what could be produced by the use of coal. The expense too, is comparatively trifling, as a man and a boy will dig as many peats in one day as will burn 180 bushels of lime; and the expense, including drying, is not calculated at one-half that of the coal necessary for burning the same quantity of lime.'—Farm. Mag., vol. iii. p. 483.

† Kent Report, 2nd edit. p. 161. We also learn from Mr. Rawson—as a hint which may prove useful to extensive farmers who have occasion to prepare large quantities of steamed food for cattle—that he has, for several years, made use of a small kiln, constructed adjoining to his kitchen. The kiln-fire communicates with flues which heat all the necessary cooking apparatus; and thus dinner has been frequently dressed for fifty persons. A cowl over the chimney carries off the steam and sulphur; and there is a stage over the kiln for drying corn. Were the lime sold, it is calculated that it would more than pay for the whole charge of fuel and attendance.

* Quart. Journ. of Agric., vol. i. p. 187.

† Derbyshire Report, vol. ii. pp. 415, 440. See also other modes of burning lime with peat, as detailed in the Annals of Agriculture, vols. xxiv. p. 8, and xli. p. 318.

1. The headlands of a strong soil, far from being of good quality, and the scourings from the bed of a small stream, having been collected and ploughed up, lime was mixed in a compost to the extent of about 96 bushels per acre, and laid upon a summer-fallow: the remainder of the field was dunged; but the superiority of the compost was evident, especially after the first crop. The effects of the dung also sooner ceased; and the ground where the compost was used was more pliant, and easier wrought, than where it had been omitted.

2. Some old yards, of a soft and sandy loam, were ploughed up with a deep furrow, and sufficiently harrowed, in the beginning of winter. Lime was then added, and turned in by the plough directly, in which state the ground remained till the spring, when it was ploughed and harrowed again, and carted to the field in the month of April, preparatory to barley being sown. A succession of good crops, of the same superiority, was the consequence.*

It would from this appear that, whether the compost consists of lime in a *hot*, or *effete state*, it will act effectually, provided the condition of the ground upon which it is to be used be such as to render a calcareous application beneficial; though there can be no doubt that the action of the former would be the most powerful. It must also be observed that, if the compost be composed of alluvial soil from the scourings of ditches, or pond-mud, or from peat—which substance will be separately treated of—perhaps three-fourths of the quantity already mentioned may be found sufficient. In contradiction to which, we extract, however, the following account of a trial made by Mr. Bailey:

3. This compost was of lime and decayed vegetable matter cut out in draining a bog, the site of an old pond of thirty-two acres: when mixed and mellowed, after frequent turnings for two, three, or five years—for some was not ready till then. It was chiefly applied on the fallows of old worn out tillage land, of a light nature, in one field of which the ridges were covered with the compost, and then missed alternately; and about 30 loads were also spread pretty thick on a sandy-soiled grass-field: but all without any apparent effect.†

Upon which it may, however, be observed, that the lime, if in a large quantity, may have been improperly laid upon 'worn out tillage,' and that the site of the pond, although described as consisting of decayed vegetable matter, may have also contained noxious substances which did not fall under the notice of the surveyor.

We cannot close this chapter without also adverting to the very just opinion generally entertained, that '*soils ought to be crossed;*' or, in other words, that composts, of which clay is the basis, should be administered to light soils, and the reverse. A petition has, indeed, been lately presented to the House of Commons, stating, 'that there are a few districts of the kingdom, however steril, which may not be brought to a successful imitation of naturally fertile soil by a *well-proportioned mixture of clay, sand, and lime;*'‡ and there can be no doubt that this amelioration of the soil, by the addition of earth of an opposite quality to that of which it consists, will, where such improvement is requisite, be found of great benefit to the land, for each acts as an alterative, and imparts properties in which the soil was previously deficient. The expense is, however, in most cases, so enormous, in consequence of the vast quantity which must be laid on to produce any sensible effect, as seldom to leave any profitable result. When the earth which is required to be added is to be found in the subsoil, then, indeed, if it be not at too great a depth, it may perhaps be dug, at those seasons in which labor is cheap, at a moderate expense; but those instances are rare, and the charge of cartage from a distance must prevent it from being undertaken by any man, although the owner of the land, who is not possessed of large disposable capital, or by any tenant who cannot secure the return of the outlay within the currency of his lease. Composts, however, may be very advantageously formed in the manner we have stated—by a mixture of lime with the earth on which it is to be laid.

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* Brown, of Markle, vol. i. p. 409. 'If 80 cubic yards are considered to be a good medium dressing for a Scotch, or 64 for an English acre, 160 bushels of lime-shells will be sufficient. Now, the length of a head-ridge opposite to four ridges of 18 feet is 72 feet, and its breadth 18 feet. If this space be ploughed 10 inches deep, it will produce 40 cubic yards of earth at each end of the ridges; while the whole work may be executed by horse-labor.'—Gen. Rep. of Scotland, vol. ii. p. 549.

*Farmers' Magazine, vol. iii. pp. 328, 329.

† Survey of Durham, p. 219.

‡ Petition of Edw. J. Lance, Surveyor, presented on the 29th of February, 1832.

MINERAL MANURES—*continued.*

MARL

Is a compound calcareous earth found in most parts of the world, and has been extensively used throughout this kingdom, where it is supposed to have been known to husbandmen at a very early period of our history. There are, indeed, leases on record, granted in the reigns of Edward I. and II., which compel the tenants to make use of it;[†] but, though still employed, it has been a great degree superseded by the more recent introduction of lime, of the properties of which it in some measure partakes. The term denoting it was formerly used in a very vague sense, for it is a substance consisting of various materials, and it has consequently happened, that what has been supposed to apply to one species, did not hold good when affirmed of another. Although principally deemed valuable on account of the calcareous matter which it usually contains, still its composition differs so essentially, that its influence as manure is but imperfectly understood; yet theoretic writings abound in general directions for its use, which are frequently found not to answer in practice, for their rules are drawn either from statements which have been made of the effect of its application on particular soils, or from analyses of its qualities, which, as these vary in innumerable instances, frequently lead farmers astray. Its real value can, therefore, be only ascertained through the practical experience of those who have either actually tried its efficacy, or who have witnessed it in their own neighborhood.

This ignorance of the distinguishing properties of marl has necessarily led to many mistakes in its application, which have occasioned the variety of opinions that are entertained regarding its use. In most places where it was anciently employed, and where its fertilizing influence was discovered to be eminently great, it was thought by many farmers that it could be made to supersede the use of dung; they, therefore, in many instances, sold their hay and straw, and although, notwithstanding this reduction of the quantity of putrescent manure, they still for a time obtained large crops, yet, eventually, the chemical effects of the marl exhausted the land. No second marling could operate upon it until it had been renovated by repeated applications of dung; and thus has arisen the old saying, cited by Barnaby Googe, who wrote so long ago as the middle of the sixteenth century, that '*lime and marl are good for the father, but bad for the son.*' In this manner, also, some valuable discoveries in agriculture have fallen into disuse through their mistaken application, when governed by local circumstances which were ill understood; wherever marl of a kind adapted to the soil has been applied, and that a judicious system of culture has been pursued, without either over-cropping, or neglecting the use of putrescent manure, the proverb is so far from being well founded, that the contrary may be safely affirmed.

The common *definition of marl* given us by the best writers on fossils, is—that it is composed of clay, sand, and lime, very intimately, but unequally mixed, slightly coherent, not ductile, but stiff, or viscid, when moist; most easily diffusible in, and disunited by, water, or even by exposure to the air, and by it reduced to a soft, loose, incohesive mass—for the most part composed of nothing more than calcareous earth—in which its chief value consists—combined with a little mineral oil, clay, and sometimes with ochre, or iron. It is also generally considered as a characteristic of marl, that it effervesces with acids, though to that various exceptions have been discovered; from which it has been supposed that, when deprived of that test, it contains no calcareous matter, yet it is found to produce ameliorating effects upon the soil.[*] Notwithstanding this summary description, its appearance is, however, as varied as its properties, being of color nearly pure white, to the darkest shades of brown and red, interveined with blue and yellow. It also exists in different kinds of land, is seldom found as a stratum of much length, but generally in detached masses at various depths, sometimes in wide and dense perpendicular layers, at others in streaks, running in lines parallel with the horizon, or again intersecting each other at right angles, usually resting on sand or gravel, and is classed, according to its qualities, into the following distinct species.

1. *Clayey marl*, which improves sandy land, and seems to act as clay in changing the nature of the soil. In land consisting of a mixture of sand and loam, or of sand and gravel, then, the

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[†] The Charta Forestæ, passed in 1225, mentions the right of sinking marl-pits; and Daines Barrington gives a quotation from Pliny (lib. xvii. c. vi.,) in which he mentions a substance used in Britain and France as manure, called *marga*, which he conceives is a mistake for *marla*. And in the Statutum Wallice, 12 Edw. I., the sheriff and coroner are directed to inquire as to marl-pits adjoining public roads, showing its then common use. The uses of marl and lime are indeed mentioned in a treatise on rural economy written in the Welsh language, and supposed to be from three to four hundred years old; of which a translation has been given by Mr. Davis, in his Survey of South Wales. It contains many curious and valuable remarks, which show that ignorance on the subject of agriculture did not prevail at that time to the extent which is generelly imagined.

[*] A bluish marl much used in some parts of Ireland, and long celebrated as a manure, makes no ebullition with acids; neither do several of the red marls; yet many of them are known to be productive of great improvement to land. See Dr. Rutty's Essay on the Natural History of Dublin, appended to the Survey of the County; and also Holland's Survey of Cheshire, note, p. 225.

application of this marl has been found peculiarly advantageous: and on all poor and thin sandy soils there is this further advantage in its use—that, from the large proportion of clay which it usually contains, it adds to their bulk and firmness, and thus has a tendency to bring them to that medium state which is the most favorable to the purposes of vegetation. It is more soft and unctuous than clay; indeed, upon slightly cutting it, it becomes so flexible, that it may be kneaded like dough, or paste, though, when the moisture evaporates, it falls into pieces: it therefore blends easily with the soil, and partaking more largely of calcareous matter, its effects, though slow, are in all the latter cases more fertilizing.

2. *Sandy marl*, which is far more frequent in Ireland than in any part of England, and is commonly found in pits of limestone-gravel, whence it is in that country usually called limestone-sand. It is seldom clammy or unctuous, like the clay marl, nor does it adhere to the tongue, but crumbles between the fingers, and feels gritty; when exposed to the air and moisture it slowly chips and moulders; and it partakes of some extraneous mixtures. Its color is sometimes like that of lead, or brown,approaching to black, and at others blue. As implied by its name, it contains an excess of sand over that of clay; for, upon analyzing it, the proportion of the former has, in most cases, been found to be from 60 to 80 per cent.; and it does not effervesce with acids so quickly as the calcareous marls. It possesses but a small degree of tenacity, and it has proved an excellent manure for clayey soils, mellowing their stiffness, and rendering them easier to work.

3. *Slaty or stony marl*, to which class, also, properly belongs that which is called *rotten limestone*, is chiefly applied to heavy land. Its operation is slow, but very lasting; land, forty years after it has been laid on, having been found to bear a closer and a better crop of grass than that which had been recently applied.

4. *Shelly marl*, which is evidently produced by the remains of testaceous fish, which, dying in their shells, become, in process of time, converted into calcareous earth, and their bodies, when decomposed, furnish a kind of mould composed of animal substance, which is no doubt analogous to the effect of dung. It is, therefore, highly fertilizing when judiciously applied to soils of every kind, which are either in themselves dry, or which have been properly drained.

Such are the most common denominations by which marl is usually distinguished, though it is susceptible of many subdivisions by those who affect to treat the subject scientifically. It is, however; more frequently classed under the sole characters of *siliceous*, *argilaceous*, or *calcareous*, according as sand, clay, or lime predominates in its composition; but, for all practical purposes, it may be sufficient to divide it into *earth-marl* and *shell-marl*.

Earth-marl.

The former, though in substance, as we have already seen, sometimes principally formed of sand, is yet, in most cases, chiefly composed of clay, and of the carbonate of lime, intimately combined, but mixed in very different proportions, by which its properties are necessarily varied. It acts as manure physically, or substantially, through the effect of the clay, in rendering soils tenacious; and chemically, by the operation of lime, in the manner which has been explained in treating of that fossil. These two substances are so completely amalgamated, that it is not possible, either by the eye, or even by a microscope, to distinguish the constituent particles of the one or of the other; the fact can, therefore, be only ascertained by chemical analysis, and the means which nature has employed in their combination is yet unknown; for although it might be supposed that mixtures of clay and lime would produce the same effect as marl, yet they will not fall to powder in the same manner when exposed to air; and it contains some other fertilizing qualities with the powers of which we are unacquainted. Thus, in the improvement of Chat Moss, in Lancashire, if a piece of marl was suffered to lie a few months upon the ground, it was found, on raising it up, that a considerable quantity of the moss adhered to it; and if the intermediate substance was examined, it appeared to be a mixture of marl and peat, formed into a mucilaginous mass of a dark color, and as soft as soap.*

Although it is very generally thought that extreme accuracy in philosophical experiments is useless in the practice of agriculture, yet it is particularly necessary to ascertain the precise difference between these modes of action; for, of course, either one or the other prevails, according to the greater or the less quantity of clay of which the marl is composed. Thus, to produce the first named, or physical effect, a much larger amount must be laid upon the land than when the second is the object; for clay can only be advantageously employed in that view upon soils that are too light; and consequently the marl must be laid in proportionate abundance, or it will not improve the condition of the ground; whilst a clayey soil would, on the contrary, lose some of its good qualities by the addition of marl, after the effects of the lime were exhausted. The intimate combination of these two substances in the composition of marl affords it, however, this advantage—that it divides, and falls to powder, with greater ease than can be effected by any artificial mixture, and therefore unites more readily with the soil.

On the other hand, if the calcareous matter in the marl be combined with sand instead of clay, or that there are, as in many instances, veins of calcareous sand intermixed, then it suits a clayey soil. The proportion in which these substances are combined is, however, so different, that they often vary in the same vein, and it is generally found that the bottom part is more calcareous than the top. From 15 to 40 per cent. is not unfrequently the portion of calcareous matter found in clay; that of a sandy nature generally contains a larger proportion.†

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* Communications to the Board of Agriculture, vol. vii., art. xliv. See also Stevenson's edition of Dickson's Survey of Lancashire, chap. xii. sect. 3.

† *Argilaceous marl* usually contains from 68 to 80 per cent. of clay, and from 32 to 20 per cent. of calcareous matter: but it has been found composed of 70 per cent. of calcareous, and 8 to 10 of sand, with clear signs of some iron.

Siliceous marl very often contains above 75 per

The stone marl of hilly countries is frequently still more abundant in calcareous substance; but it also, in many other places, contains such large quantities of extraneous matter, that it may be properly considered as belonging to the earthy species, and has, in some instances, been laid upon the land to the extent of 400 to 600 single horse cart-loads per acre, which heavy labor renders the use of lime more economical, although carried from a greater distance, except in cases where the chief object is to loosen very stiff clays, on which it acts with considerable effect.

The origin of earth-marl is a subject of curious inquiry. It is an object, however, of only secondary importance to farmers; but we refer those who feel interested in it to an ingenious treatise, which may be found in the Appendix to Holland's Survey of Cheshire.* Those kinds of which we are now treating are often found at the base of chalk hills, or in the valleys formed between them, and have probably arisen from the chalk which has been washed down by the rains, together with the vegetable and animal matter of various descriptions which collect and combine together; for, on analyzing them, they are found to contain clay, sand, loam, and chalk, and in proportion to the quantity of other substances with which they are combined, they are either saponaceous and clammy, or crumble if largely mixed with calx. Earthy marls are, however, found in beds of such distinct substance, that a body of sandy marl has been known with a regular bed of limestone under it, and a stratum of clay-marl under that; in which case it is evident that the clay at the bottom, if it was not the native soil, must have formerly formed some part of the hill towards its base. The color of marl is thus occasioned by the nature of the mixtures of which it is composed; for pure calx, or chalk, being white, necessarily imparts a similar hue in proportion to the quantity of calcareous matter which it contains; while the red tinge so perceptible in much of the clay-marl is a strong evidence of the existence of iron. There is also a sort of clay which, from its soapiness, is often mistaken for marl, though differing essentially in its requisite properties. This earth appears to be impregnated with sulphur, and other mineral substances injurious to vegetation, which renders it expedient that farmers who are not already well acquainted with its nature should either use it at first cautiously, or have it carefully analyzed by some competent chemist.†

Shell-marl.

Shell-marl is usually of a bluish color, soft to the touch, and somewhat resembling potters' earth; but when exposed to the air it crumbles, and falls into a powder, nearly in the same manner as lime does in slaking.

The nature of this marl is very different from those of earth or stone; for it contains both stimulant and fertilizing properties which do not belong to the former, and from its effects upon the soil it has been classed among animal manures, though it more properly resembles a compost formed of earth and lime, with animal and vegetable substances, for which reason it is justly considered preferable to the others. It exists at the bottom of most lakes, and under bogs and morasses, or other pieces of stagnant water which have been drained, and might, no doubt, be found in every place where water has originally rested; though, as it is usually under other layers of earth or peat, its depth below the surface is often too great to admit of its being searched for with advantage. Every farmer should, therefore, carefully examine the sides and bottoms of his ditches and ponds, for, by doing so, he may often find appearances of marl in places where it was not suspected, and large beds of the most valuable sort have been in that manner discovered, which might have remained unnoticed for years.*

It is chiefly composed of those myriads of small shell-fish which, with other fry and insects, usually procreate wherever there are pools of water, and the remains of which have, in the course of past ages, been deposited along with sand and decayed vegetables, or other matter swept from eminences, or by the decomposition of aquatic plants. This process of alluvion has, in the lapse of time produced those masses of shell-marl which display the most striking effects when employed as manure; for the shells, when decomposed, are converted into lime of such purity, that some moss-marl, examined by Dr. Coventry, was found to contain 84 per cent. of pure chalk—which is more than is generally possessed by the purest lime—and the mould formed of the other substances must be very rich.† It may, therefore be converted into quick-lime, by burning, or it may be used in its natural state; but then it is not so minutely divisible, nor so soluble in water, and is of course, more tardy in its operation; its effects, however, continue longer, and it is apparent that, as it contains more calcareous matter than the common qualities of lime, it may be used in smaller qualities. When spread upon grass, or clover, it is found to promote the growth of the herbage, for it partakes of the nature of pounded limestone, and possessing none of the caustic properties of

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cent. of sand, consequently chalk and sand are the predominant ingredients. Kirwan on Manures, p. 13.

The analysis made by Von Thaër, of a quantity dug out of pits at Oldenburgh, in Germany, showed it to contain in 100 parts

Of fine sand - - - - - -	36
Clay of a soapy kind - - - -	44
Mould - - - - - - -	5
Carbonate of lime - - - -	14
Gypsum - - - - - -	1

—*Principes Raisonnés d'Agriculture,* 2de ed. tom. xi. p. 423.

* On the nature and origin of marl, by J. J. Stanley, F. R. and A. S.

† See Malcolm's Compendium of Husbandry: Anal. of Main., vol. ii. p. 70—85.

* Malcolm's Compendium of Husbandry, vol. ii. p. 85.

† Farmer's Mag., vol. iv. p. 136. By other experiments made by Sir G. Mackenzie (ib. vol. v., p. 271,) it appeared that some shell-marl was composed of

Lime - - - -	41 25	in 100 parts.
Carbonic acid - -	32	
Silex - - - -	14	
Argil - - - -	4	
Oxide of iron - -	2 5	
Inflammable matter -	2	
Loss - - - -	4 70	

quick-lime, it may be used without hazard as a top-dressing. It also occasions heavy tillage crops; and if the land be not over-cropped before it is returned to pasture, the turf is found to be closer, more plentiful, and sweeter than before; but on cold damp soils, which have been heavily worked, the crops of grain have proved later, and the corn lighter than on land which has been limed.*

Marl pits.

The common mode of searching for this, and every other kind of marl, is, by the boring-irons used in seeking coal, and other mineral substances. It may, however, be easily effected by any farmer who has reason to suspect its existence on his own land, by using a long pole, furnished with an iron auger fixed at its end; but if this does not reach the marl within about twenty feet below the surface, the sinking of pits, unless the quality be very superior, will seldom be found to answer the purpose. The pit is usually opened by digging a ditch of four to six feet broad, by twelve to twenty long, the surface earth being generally thrown on one side, and of the sub-soil, or virgin earth, on the other. The marl is then extracted in square pieces with a small cutting spade, either to its full depth, or to that to which it can be taken without danger; for care must be observed in preventing it from falling in, by which serious accidents have very frequently happened. The pit is then either so far filled up as it will allow, with the clay rubbish, or other earth of the sub-soil, covered by that of the surface; and if it be not of great depth, it may, with a little attention, be easily brought to a level with the rest of the field: if not, it is in other places formed into ponds; but in that case, or if left in open pits, the precaution should be observed, of either fencing them round, or sloping their sides, so as to guard against accidents.

In those places where marling is regularly carried on throughout the year, it is generally managed by persons who make it their sole business; but when the farmer's teams must be employed, it can be only done from the latter part of autumn until the commencement of the spring sowing, or during the intervals of other work, though it may be carted upon the land at all times which may be found convenient. The expense depends upon a great variety of circumstances, but chiefly upon the depth from which the marl is dug, and the distance to which it is to be carried. The nature of the surface-soil, and the charge of removing it —the tenacity of the marl, and the quantity of water with which it may be covered—all vary according to the locality: then the carriage, particularly of clay-marl, is so heavy, that unless it can be found nearly adjoining the farm, it will rarely pay the cost of removal; for the work is so severe that, even in the slack time of winter, the cattle will require better food than is usual at that season, and the wear and tear is also considerable. All weighty considerations, which, when compared with the tenure of the land, deserve mature consideration before the improvement be attempted.†

Tenants should, therefore, be cautious how they undertake it, unless backed either by the security of a long lease, or by entire confidence in the estimation of their landlord; for a very considerable period may elapse before it incorporates with the soil, and, consequently, before any benefit can be received from it. Of which, that able farmer Mr. Macro, of Suffolk, gives an instance, in 120 square yards having been laid upon some very poor soil at an expense that would have purchased the fee simple of the land; yet no visible improvement was effected in comparison with other ground which had not been marled, until very long afterwards, but then it evidently obtained an advantage, which it maintained after a lapse of twenty years.†.

[To be continued.]

From the Genesee Farmer.

LAMPAS OF HORSES.

As the season of the year is now approaching, when some people commence one of the most cruel and barbarous practices ever retained by any people, pretending to be civilized—viz: that of burning out the lampas from the mouths of young horses, we cannot refrain from making a few remarks upon that subject.

We are sensible, that some of our most enlightened readers, will say that this article should appear under the head of *vulgar errors;* but yet we have what we consider a reasonable excuse for not putting it there. Most of the articles which have been placed under that head, in our paper, are rather innocent delusions, than partaking of the barbarous; rather superstitious rites and ceremonies, appertaining to property, than any retained usages of the dark ages of barbarity. At what time or with what people this practice originated, we will not pretend to say; but there is one nation, who should either discontinue the practice, or else say less of the general diffusion of useful information; *that is America.*

The idea that the enlargement of that part of the roof of a horse's mouth, is a disease, has long been exploded by all veterinary surgeons. All horses are subject to it, between the ages of three and five, more or less; and in many cases, this soft spongy enlargement, descends to a level with the fore teeth, yet upon examining it, there will not be found any marks of tenderness or inflammation indicating disease; and if left to the operations of nature will disappear, and the horse will have a sound and healthy mouth. Not to speak of the danger of bleeding the horse too freely, by opening the palatine artery, the manner of performing the operation, is shocking to the feelings of humanity, as well as painful to the animal. It is uncalled for, and must be considered a piece of wanton cruelty.

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* Reports of Roxburghshire, p. 135. Forfarshire, p. 407.

† The price of good marl, when raised by contractors, is charged at such various prices in different places, that we should probably mislead some of our readers if we were to state them. It is computed at separate sums for groundage, digging, and spreading upon the land; but independent of the cost of carriage, which is to be added. We may, however, observe that, when taken from the wastes or commons, it is the practice of some landlords to charge 5s. an acre for the land marled; others 2d. per farm-horse load; and in some parts of the north the expense has been thus calculated: paring the marl, say of 3 feet of superficial soil, 12s. per cubic rood of 64 yards; getting and filling the marl, 12s.; loading it, supposing the pit to be at the distance of 100 or 150 yards, 21s.; and spreading, 4s. per rood.—Cheshire Report. p. 223; Stevenson's Lancashire, p. 496. In Hampshire, the total charge of marling, when done by the farmer's men and teams, at an average distance of 80 rods from the pit, is stated at £3 10s. per acre, presuming the quanty laid on to be 30 cart-loads of 1½ ton each; that is, taking cammon laborers at 2s., and horses, including wear and tear, at 4s. per day.—Vancouver's Hants, p. 337.

† Annals of Agriculture, vol. i. p. 286.

From the Fredonia Courier.

FRENCH HAY.

Many of our readers, at least, will be surprised to learn that hay from France has been imported into this country. A cargo lately arrived at Charleston, (S. C.) and sold for $1 62 per hundred. A cargo of American hay, which arrived about the same time, from Portland, (Me.) sold for $2 per hundred.

From the New England Farmer.

BEET ROOT SUGAR.

It is stated in papers in the northern parts of France that large orders have arrived from the United States for supplies of beet root sugar.

FACTS AND ESTIMATES RESPECTING BEET SUGAR.

To the Editor of the Farmers' Register.

Columbia, S. C., July 1, 1836.

In the February No., 1836, of the *Journal des Connaissances Usuelles*, for which I subscribe with much satisfaction, I find an analysis of a treatise on Beet Sugar, by M. Mathieu Dombasle, 1836, *chez Huzard a Paris*, 1836, *prix* 1 1-2 *franc.*, 2nd edition.

The facts, in brief, are these:

1000 kiliogrammes of beet root, will yield, to a careful manufacturer, 6 per cent of good merchantable brown sugar, or 60 kiliogrammes: which can be refined into excellent loaf sugar by the usual process.

1000 kiliogrammes of beets can be purchased by the manufacturer for 16 francs.

By careful and accurate analysis,, 10 per cent of such sugar can be extracted from beets; but six per cent is the usual quantity, and improvements are contemplated that may produce 8 per cent.

The expense of manufacturing 1000 kiliogrammes of sugar from beet root, is calculated at 12 francs.

The residue is worth 3 or 4 francs as food for cattle.

Put this into English.

A kiliogramme is 2 1-5 lbs. averdupois: 1000 kiliogrammes will amount to 2200 lbs.: and 60 kiliogrammes to 132 lbs. averdupois.

A franc, in merchants' accounts, here in America, is calculated at 20 cents, though hardly worth 19.

A sous is the 20th part of a franc, or one cent; or one half penny English. The cost of beet root and of manipulation for 132 lbs. of brown sugar, will be 28 francs: from which, deduct 3 for the residue, and there will remain 25 francs, or 500 cents, the price at which 132 lbs. of sugar can be manufactured, not quite 4 cents per lb.

The French reviewer of the book, calculates the expense at 5 sous per lb. French, which is either 7561 grains English to the lb., or 7717 grains, for both these numbers are found on good authority. The latter I take from Kelly's Cambist. The English lb. averdupois is 7000 grains; hence, there is but little variance between my calculation and that of the French author.

I confess I was astounded at these facts. Sugar from beets at 5 cents per 112 lbs., when cane sugar is nearly three times the price to the consumer in this country.

As to the value of the beets. I think we could afford them as cheap here. I am sure they could be raised for less in the confines of New York and Pennsylvania, where they grow with very great luxuriance.

I lived some years a mile and a half from Altringham in Cheshire, (England.) At Altringham, (a sand hill,) they grow carrots thus. They manure at the rate of 10 lbs. sterling per acre, every 3 or 4 years, purchasing horse manure at 4s. 6d. per three horse load at Manchester. They haul the dung ten miles. They plough with 4 horses as deep as possible. They sow their carrot seed by rubbing together one-third carrot seed, and two-thirds sand, broadcast. They hoe with a ten-inch hoe, leaving the roots about a foot apart. They get from 12 to 16 tons per acre. Arthur Young somewhere talks of 19 tons of carrots per acre. I used to buy them laid down at my door at 4s. 2d. per 250 lbs. weight, not washed. I fed my horses chiefly with carrots, when they were in season.

Pray think a little on these facts. Has not every farmer on rich, light land, a sugar plantation at his door?

THOMAS COOPER, M. D.

For the Farmers' Register.

NOTICES OF THE SEASONS IN OLDEN TIMES.

The extraordinary winter which has not long since left us, has caused me to examine into the state of the seasons and weather at the earliest periods of our history. It has long been the opinion of the writer, from facts gathered from the different histories of the country, that the common idea about a permanent change of our climate from cold to a warmer temperature, is a mistaken one. I will not undertake to say, that the clearing up of the woodlands of the country, and the draining of immense swamps and marshes, have no effect in the average temperature. But it seems to me, that proof is wanted to substantiate such a position. It is probable, that no one doubts, that the climate is improved in health by the clearing and draining of the country. Until within five or six years, very few, it seemed to me, doubted that the climate of our country was moderating, and had been gradually moderating in temperature, from the first settlement of the country. Is this so? I do not, for one, believe in the opinion, but will give facts as stated by our historians, and let every one form his own opinion. In referring to these, it will be more interesting to give extracts, and not to be studious about a logical arrangement of matters. Let us proceed and see if the weather 200 years ago was not, for a series of years, about the same kind of weather which we have had for the last 25 years. The following account of our climate about the year 1608, is given by Smith. The first permanent settlement of Virginia was in 1607. "The summer is hot as in Spain: the winter cold as in France or England. The heat of summer is in June, July and August, but commonly the cool breezes assuage the vehemency of the heat. The chief of winter is half December, January, February, and half March. The cold is extreme sharp, but here the proverb is true, that no extreme long continueth.

In the year 1607 was an extraordinary frost in most of Europe, and this frost was found as extreme in Virginia. But the next year for 8 or 10 days of ill weather, other 14 days would be as summer."—*Smith.*

This winter (1607) was extremely cold in Virginia, and it was likewise remarkable for an extraordinary frost in Europe.—(Stith's History.) This was the winter in which Capt. Smith was taken prisoner in a swamp on the Chickahominy, by Opechancanough.

This winter (1607) is noticed in the life of Gorges, to have been dreadfully severe in New England.—(Belknap's Life of Sir F. Gorges.)

It may not be uninteresting to remark here, that the year 1607 was a year in which Halley's comet returned, in its revolution of about 75 years. The appearance of the same comet last fall, was the third appearance since 1607. The same comet appeared in 1682. On the 11th December, 1681, the Delaware river froze over at Chester; yet Wm. Penn, in a letter written in 1683, says that the winter of 1681—1682, was mild, scarce any ice at all. The winter of 1682—1683, was his first winter in Pennsylvania, and he says it was the coldest the oldest liver in the province could remember. "From December to the beginning of March, we had sharp, frosty weather—a sky as clear as in summer, and the air dry, cold, piercing and hungry." He intimates that the great Delaware was frozen up for a few days; but he does not speak of extraordinary cold weather. (Mr. Penn's letter to Free Society of Traders.) I find but few notices of the winter of 1759, the next appearance of Halley's comet. On the 6th December, 1758, the weather was cold and the ice run violently in the river at Pittsburg—it snowed—22nd, cold and stormy—27th, it snowed the whole day—28th, do. 3rd January, 1759, it snowed, freezed and rained—9th January, the Susquehannah was crossed on the ice.—(Journal of C. F. Post, 1758—9.)

The winters of 1779—80, 1782, 1791, were very severe in Virginia. It is asserted by Burk in the 1st chapter of his history of Virginia, that it is known by actual observation and experiment, that the climate of Virginia has perceptibly changed within the last 30 years. The winters are neither so long or severe as formerly, and there is a proportional abatement in the heat. He undertakes to state the causes of the supposed change of climate. This was written about 1804. Now it seems to me if Burk had experienced our climate since 1829, he would not have entertained longer, or hazarded such opinions. It seems to me, that this alleged change of our climate is altogether ideal, and has no foundation in fact. Judging from historical data, we have in these days the same kind of seasons experienced here 230 years ago. Some winters were uncommonly cold—some very moderate. So has it been of late years. But so far from the winters being shorter and less severe than formerly, I do not believe it can be shewn by recorded facts, or by the memory of man, that there ever was before in this State, a succession of such severe winters as have occurred since 1829. I can find a record of no such winter as the past. By referring to the recorded facts in other States relative to the climate, we find the same evidence as to the similarity of the seasons many years ago, and for a few years past. We find it stated in Pennsylvania in 1760, that the winters there were longer and more severe than in England—the summers hotter and dryer—the springs very short—the autumns long and mild. The snows are frequently very deep in winter, and the frosts so intense, that it has not been very uncommon for the large river Delaware, even where it is near a mile broad, to be frozen over in one night so as to bear people walking on the ice in the morning—which river sometimes in the winter season for several weeks together, even opposite Philadelphia, is as much frequented with loaded carriages as any part of *terra firma.* They had their warm winters at that remote period, as well as cold ones, and the following account of the weather in Pennsylvania written in 1729, more than 100 years ago, although written in poetical language, is doubtless accurate. It was written in Philadelphia by Thomas Makin.

"Yet oft tho' warm and fair the day begun,
Cold storms arise before the setting sun,
Nay oft so quick the change, so great its power,
As summer's heat and winter in an hour!
So violent the wind, that oft the ground
With rooted trees is covered wide and round;
Sometimes the ice so strong and firm is found,
That wagons pass as on the solid ground,
But yet so temperate are some winters here,
That in the streams no icy chains appear,
And all the season boats and shipping may
With oar and sail divide the liquid way:
So various and uncertain is the clime,
For heat and cold extreme in little time."

Such being an account of the seasons 100 years ago in Pennsylvania, it seems not difficult to form an opinion as to the alleged change of climate, from our own knowledge of the climate the last few years.

Samuel Williams, a very able man and formerly Professor of Natural Philosophy in Harvard College, takes, in his History of Vermont, the same ground as Burk, relative to a change of climate. This dissertation on climate is long and learned, and contains some tables of meteorological observations made by the Doctor himself in Rutland, Vermont, in 1789—90—91. The greatest height of Farenheit's thermometer during that period, in latitude 43 degrees 36 minutes, was 93½ degrees. The least was 27 below 0. The mean heat was 43½ degrees from all the observations. The temperature of the water in deep wells in the same place, without variation in summer or winter, was the same 43½ degrees.

Dr. Williams wrote his history about 1794, and he says "the cold of the winters decreases—the rivers are not frozen so soon—so thick or so long, as they formerly were. A remarkable change of this kind has been observed in all the settled parts of North America. The bays and rivers in New England are not frozen so hard or so long as they were at the first settlement of the country. At the first settlement of Philadelphia, the river Delaware was commonly covered with ice about the middle of November, old style. It is not now covered with ice till the middle of January." Dr. Williams for the last assertion, refers to Kalm's Travels. Kalm travelled in Pennsylvania about that period, and the Delaware might on one or two occasions have been covered with ice about the middle of November; but the assertion in its broad sense is evidently incorrect. We consider the account given by Penn at the very period, and on the spot, and the account given by Makin in 1729, 46 years afterwards, as much more entitled to credit than the researches of a passing traveller. It is well known, that for the first 150 years or more after the settlement of this country, no particular or minute accounts of the weather appear to have been kept. It is very certain, that notices of the climate, or weather, anterior to 1750, are exceedingly scanty. But scanty as they are, they furnish strong if not conclusive evidence, that the major part of the winters for the first 150 years after the settlement of the country were moderate, equally so as the winters of modern times. After the extremely severe winter of 1607, we find very rare notices of severe winters up to the commencement of the present century—mild winters would of course pass without recorded notice. Immediately succeeding 1607, it is fair to infer, that for many years the winters were mild—it is fair to draw such an inference from a perusal of the events and circumstances of those periods, and in the absence of all notice of severe weather.

Kalm travelled in this country in 1749. It was from the *old* Germans in Pennsylvania, that he derived the information of the change in the winter seasons, from cold to more moderate. And the ancient people at Quebec, in 1749, informed him that the winters in Canada were formerly much colder than they *then were*. The Baron Lubantar put to sea from Quebec the 20th November, new style, in 1690, the like of which he says was never seen before in that place; yet we well know, that at that period it was impossible to obtain information at Quebec of the actual state of the climate there, for many years anterior to 1690. In 1794, Dr. Williams says that the St. Lawrence is *now*, not frozen over till the latter end of December or beginning of January. If Dr. Williams had experienced the last six winters, it can hardly be doubted, that he would have changed his opinion as to the gradual moderating of our winters.

We have satisfactory evidence, that the information given to Kalm in 1749, that the Delaware was formerly frozen over by the middle of November, is wholly devoid of foundation. The following notices from the gazettes of the periods, were collected by Samuel Harvard, Esq. They are interesting, and do not occupy much space. I give, however, only a few—such as are conclusive to prove the incorrectness of the information given to Kalm.

1681, December 11th. The Delaware froze over that night. 1704. Snow fell one yard deep.

1714, February. Flowers seen in the woods.

1720, December 20. Our river is full of ice 27th December. The river is now clear of ice.

1721. The river is full of ice. 26th December. The river is locked up. January, 1722. Vessels get up to New Castle. February 6. Vessels cleared and entered.

1723, January 1st. Weather is yet moderate and our river open. 6th, do.—and free from ice. December, same year. Vessels enter and clear through the month. 1724, January 18th. River free from ice. December 22. River full of ice. 29. Some driving ice. 1725, 3rd March. A snow 2 feet deep, which had not been known for some years. 1725, December 21. River full of ice, but not closed.

1726, January 18. Entries and clearances. December. Do. through the month. 1727, February 14. River not closed. 1728, 23rd January. River frozen up—very hard weather for a fortnight previous. December 31st. 36 vessels, &c. frozen up at docks. 1724, Feb. 17. Entries and clearances. Dec. Do. through the month. 20th Jan. 1730. A very deep snow—river full of ice. 27th Jan. A vessel cleared. Dec. 29th. Entries and clearances.

1731, December 14th. River full of ice. 21. River a little opened. 1732, December. Entries and clearances. 1733, January 18. Great snow at Lewes. December. Entries and clearances. 1734, January 1st. River continues open, and even then very moderate—winter hitherto as moderate as for many years past. December. River free from ice—weather fine and open.

1735, 16th January. River open and weather very moderate. December. Entries and clearances. 1736. 6th January. River is fast and full of ice. February 5th. Arrivals. 25th. Two whales killed at Cape May. December. Arrivals and clearances through the month.

1737, January 20th. Weather very cold—persons frozen to death—river frozen up. December. Entries and clearances through the month; also through January and February, 1838. December, do., till the 18th. 1739, 25th January. River clear of ice. December. Entries and clearances. 1740, January 10. No entries, &c. till 21st February. March 15th. Ice broken up in the Delaware. December 19th. River frozen up till 13th March. From Lewes it is all ice towards the sea as far as the eye can reach. Tuesday and Wednesday are thought to have been the coldest days for many years.

5th March. The severity of the winter complained of throughout the country—cattle dying from want of fodder—many deer found dead in the woods, and some came tamely to the plantations, and fed on hay with other creatures. 13th March. River navigable—the winter extremely long and severe. 19th. River now quite open—vessels daily come up.

April 19th. We hear from Lancaster county, that during the great snow, which in general was more than 3 feet deep, the black inhabitants suffered much for want of bread, &c. &c. The Indians fear a scarcity of deer and turkeys. December. Entries and clearances. 1742, January. Do. 22nd. Comet visible for some time. February and March. Entries, &c. December. Do. No mention of ice. January, 1743. Do. 1744, 3rd January. River full of ice. 19th. Arrivals. December. Entries and clearances. 1745, January, February, March, and December. Entries and clearances—no mention of ice.

1746, 28th December. River frozen up for a week. 1747, February 24th. First arrivals since 22nd December. December 15. River full of ice. 1748, January 12th. Entries and clearances. December. Do. Through the month.

So much for the information of the old German inhabitants to Kalm. The above notices are from actual data printed at the times specified. There is not a single instance noted of the river being frozen up in November, and but few instances in the month of December. Here are authentic notices of the climate of the Pennsylvania winters, as far back as 1681, 70 years anterior to the visit of Kalm. Philadelphia was then a wilderness, and no permanent settlement had been made in Pennsylvania, on the Delaware, except at Chester in 1675.

There is abundant reason to believe, that the accounts given in other States of the great severity of the winters in olden times, are equally devoid of correctness. It is probable the moderate winters were forgotten, and the very cold ones made a lasting impression on the memory. We know, that in ancient history, we have no record of consequence of events in times of *peace;* we read only of *wars.*

Mr. Jefferson in his Notes on Virginia, written in 1781, refers to the change of climates, &c. and seems to agree with what is said by Dr. Williams and others.

He says: "A change in our climate, however, is taking place very sensibly. Both heats and colds are become much more moderate, *within the memory of even the middle-aged.*" Now those who have experienced the cold of the last few winters, and the heat of the summer of 1834, will not hesitate to believe, that Mr. Jefferson and the middle-aged of that period, drew wrong conclusions, and if now alive, would not entertain such notions. He speaks of the long and cold winters of olden times, on the authority of the *elderly,* and they were as much mistaken, it seems to me, as the old Germans who undertook to inform Kalm. "Snows are less frequent (in 1781) and less deep. They do not often lie, below the mountains, more than one, two, or three days, and very rarely a week." They are remembered to have been formerly frequent, deep, and of long continuance. The elderly inform me, the earth used to be covered with snow about *three months* in the year. The rivers which then seldom failed to freeze over in the course of the winter, scarcely ever do so now." —*Jef. Notes.*

In remarking on these observations, it will be evident to all, that Mr. Jefferson in 1781 describes a milder climate, much, than we have experienced of late years. We have had more freezes and more snows which continued for moderate periods, than he describes. But *when* were those winters with deep snows, and of long continuance—with the earth covered with snow about *three months in the year?* In 1781, the *elderly* speak of them. Their memories are proven to have been faulty by recorded facts. We have seen that, at the first settlement of the country, the winter of 1607 was excessively severe here and in Europe. We have Smith's history from that period to about 1630. During that period, he mentions no other severe winter, and it is clear from his detail of events, movements and operations, that they had during that period none of the long freezes and snows spoken of by the elderly in 1781. It is true we find but few notices of the weather, earlier than the notices aforesaid, commencing with 1681. But it can hardly be doubted, we should have had them, if instances of extraordinary severity had occurred. We think it also fairly inferable, that those winters of three months snow, never had an existence here, from the facts, that the events described in our history could not well, if at all, have happened, if such had been the weather. From 1681, we know such winters had no such existence here, except, perhaps, the winter of 1741 and 1780. We can fairly say we know this, because if no such winters happened as far north as Pennsylvania, no one can believe they happened here. We have brought the notices down to 1749. By referring to the diary after that period, we find that the weather for the next 30 years up to 1781, was very similar to those years noticed above. There was but one winter of three months cold weather in Pennsylvania, and that was 1780. The Delaware was not generally, and in fact but rarely frozen over in the month of December. It may not, however, be amiss to remark that from the recorded notices of the weather before referred to, there seems to have been more cold winters from 1750 to 1780, than from 1720 to 1750. On the whole, it seems that there is not proof, that the winters, one or two hundred years ago, were generally colder than the winters since 1800. An examination of the recorded notices of the winters up to the present time, will clearly show, that the winters have become neither milder or shorter than they were at the first settlement of the country.

The want of leisure, at present, prevents me from referring particularly to meteorological tables to substantiate the view above taken. But there is little doubt, that such tables, for the last 80 years, would show that there has been no abatement in the average temperature. Perhaps the subject may be resumed hereafter. The subject, of what winds were most prevalent on this continent 200 years ago, would also afford much curious speculation, and would doubtless be interesting. For the last few years, many have been the complaints that the easterly winds had much increased of *late years.* It will be found on examination, that precisely the same complaints were made sixty, if not 100 years ago. S.

From the Cultivator.

BEET SUGAR

We have received a communication from a friend, soliciting our co-operation with the friends of improvement in Pennsylvania, in furthering the culture of the beet, and the manufacture of sugar from this root. Some gentlemen in Philadelphia, impressed with the importance of the subject, have patriotically sent Mr. James Pedder to France to acquire the knowledge requisite to the culture and manufacture. Our correspondent says, "I have seen samples of the sugar made from the beet root, equal to the finest loaf I ever saw, and which only cost nine cents per pound in France. When I return, I will furnish you with the sample. France last year manufactured eighty millions pounds."

Had our correspondent examined our last volume, he would have seen that we had anticipated his request. At the suggestion of a correspondent in the far west, we gave a summary of the mode of culture and manufacture, from M. Chaptal, than whom no one was more competent to instruct, as he conducted the business on a large scale for twelve years, and was withal, one of the best chemists of the age. This summary will be found in pages 85, 86 and 114.—The whole process is minutely detailed in Chaptal's "Chemistry applied to Agriculture." We stated that beet sugar could be successfully cultivated in France, when foreign sugar did not compete with it in the market at a less price than ten cents per pound. We did not then consider, nor did our readers probably understand, that the remark then had reference to *refined* sugar. The fact now seems to be this, that beet sugar, equal to our double refined loaf, which now sells in the New-York market at eighteen and twenty cents per pound, can be profitably sold in France, by the producer, at nine cents per pound, or at half the price of cane sugar. It follows as a matter of course, for bating the difference in labor, we *can* produce it here as cheap as they can in France, that the culture of the beet, and the manufacture of beet sugar, can be rendered *a profitable business* in this country. Our soil and climate are well adapted to the beet; and in the interior, in particular where the price of foreign sugar is enhanced by the charges of transportation, beet sugar must ere long be among the staple products. As an offset to the difference in labor, we have an advantage in the cheapness of land. Chaptal's estimates are predicated on a rent of 40 francs ($7.60) per acre.

Chaptal states his average product in beet roots at 40,000 pounds the hectare (which is 2 acres 1 rood 35 perches English); that in his establishment he operated upon 10,000 pounds in a day; that this quantity (10,000 lbs. roots) produced of

1	Refined sugar, 187 lbs. worth - - - - - - -	210	francs.	
2	Middling do. 67 lbs. worth - - - - - - -	67	"	50 c.
3	Trimmings, 1,090 kilogrammes, (fed) worth	2	"	50 c.
4	Mash, (fed to stock) 1,250, worth - - - -	30	"	
5	Molasses, 130, worth - - - - - - - - - -	12	"	
		322	francs.	

equal to about $61 on the products of one-fourth of a hectare, or something more than half an acre of land. The expense of cultivating an acre is stated at 133 francs, about $25, which includes 40 fr. for rent, and 10 for taxes, and leaves about $15.75 for cultivating, digging, transporting and storing the crop. He states the expense of cultivating and manufacturing 10,000 lbs. roots, including all charges, at 192 francs, about 36 dollars, leaving as a profit on this quantity of roots, about $25, say $35 the acre, clear profit. Upon 1,200,000 lbs. of roots, the average produce of three hectares, he estimates a nett profit to the manufacturer, after deducting interest on capital, repairs, &c., of 6.650 francs, about $1,260.

After penning the above, we received the interesting letter of M. Le Ray de Chaumont, which will be found under the head of correspondence, showing the importance of beet sugar as a household manufacture.

ANTICIPATED CHANGE IN THE AGRICULTURE OF THE UNITED STATES.—SILK, AND BEET SUGAR.

Some considerable time has now passed since we yielded, slowly and with difficulty, to the belief, that the introduction of silk culture in this country would be extended widely and profitably: and since adopting that opinion, we have made continually repeated efforts to impress on the people of Virginia, and the other southern states, the superiority of their facilities—in better climate, cheaper land, and surplus and now expensive hands—for carrying on this new business, over those of our northern countrymen, who have already proved the advantages to be derived, and are investing large capitals in numerous adventures for this object. In New England, where most of these efforts are making, there is no superfluity of labor. Fortunately, every poor female, and all persons infirm from either tender or advanced age, may be, and annually are, employed profitably, according to their measure of bodily power. Yet still it is considered profitable to *divert* much of this labor to the silk business: and that too, in a climate so rigorous that artificial heat must be used frequently in rearing the worms, and the best kinds of mulberries are often greatly injured, if not killed to the ground, by such severe winters as the last. In Virginia, there is no difficulty as to climate—thousands of now unemployed and expensive hands might be given to the work—and lands, now unprofitable or neglected, and at very low prices, would serve as well for planting, as those selling ten or twenty times as high in New England. Putting all views of greater pecuniary profits aside, if the silk culture could be established in Virginia, without any absolute loss to the undertakers, a great moral and political benefit would be gained, in giving the bread of independence, and of honest labor, to thousands of destitute females, who have now no resource but to live on the charity of others, or to starve on their own ill-paid labor of the needle.

Another new kind of industry now seems likely to be introduced, and established with profit—and which, in a different manner, offers great benefit to the agriculture of a large portion of the United States. This is the making of sugar from beets. We readily confess, that until very recently, we considered this scheme worthless, and absurd in every country that could freely import sugar produced from the cane—and that this species of industry, which could not be established by the iron despotism of Napoleon, and the protection afforded by his "continental system," could not exist in times of peace and of comparatively free trade. But we have been forced to yield the opinion to such facts as are presented in the letter of Professor Cooper, and other pieces in this No. which are but specimens of many that have recently appeared. If, as seems to be undeniable, beet sugar can be made cheaper than that of the cane can be bought, there is an end of all question and doubt as to profit. There is also an agricultural benefit to be expected from the new culture of beets, for sugar, that is very important, and that is an addition to all the pecuniary profit expected from the sale of sugar, and the profits of live stock fed on the pulp left after the saccharine matter has been expressed. This is the introduction in our farming of what is so greatly needed, an increased extent of culture of roots, or green and meliorating crops, to take the place of our too extensive grain culture. The culture of beets for sugar, and the use of the pulp as food for cattle, must necessarily make the rotation of crops more mild, and add greatly to the improvement of the soil—and by this means, would ultimately add very far more to the fertility and wealth of a country, than as much grain culture, even though the pecuniary profits to the farmer, at first, might be no more. The same important consideration applies also, though in a different manner, to silk culture. Thus it may well happen, that the introduction of these two new kinds of culture, even though not attended with greater pecuniary profits, (or not much greater,) at first, would be productive ultimately of far greater to each individual farmer, as well as of greater moral and political benefits to the nation.

This important consideration of the advantage of beet culture to a rotation of crops, is properly appreciated in France. The latest French article on the subject that we have seen is from the pen of M. Soulange Bodin, and appeared in the *Annales de l'Agriculture Francaise* for April, 1836. We offer a translation of a passage on this head.

"The Viscount Morel de Vinde, in these Memoirs, has then presented the sugar beet as being the best, or rather the *only kind* of tilled plants which, in the four-shift rotation can usefully be substituted for the year of naked fallow [to prepare for wheat;] and he thus *considers as connected the universal perfection of our agriculture, with the manufacture itself of sugar from beets:* a manufacture which, by its indefinite extension, and demand continually renewed, ought to give greater encouragement to the culture of this plant, which is susceptible of having, from this moment, a general use, and a certain sale. Indeed, he says, the [making perfect the] four-shift rotation, consists in finding a plant that is not exhausting to the soil—of which the tillage is confined to one year, and serves well to cleanse and to pulverize the soil—and of which the products, not yielding a kind of food for men before indigenous, or belonging to the country, shall however be in general use, and command a certain and ready sale. The beet, applied to the making of sugar, fulfils perfectly the conditions of this problem." * * * "It may also be observed, that the plant which by the production of this sugar, renders possible the universal improvement of agriculture, furnishes besides, by its remains, [as food] the best of all manures from cattle. This plant fulfils so completely all the conditions required from tillage crops, that it *would be necessary to substitute it for the naked fallows, even though it should not yield otherwise* [*and at first*] *such rich or important products*."

In a report of the Council of Agriculture, Manufactures and Commerce, which was also published in the *Annales*, it is stated by the Minister of Commerce (presiding at the meeting) that the manufactories of France in 1835, yielded 25 millions of kilogrammes of beet sugar, of the value of 85 francs the quintal, which is equal to one-third of the annual consumption of the kingdom; that 50,000 hectares of land were then subjected to the culture of the plant; and that in those parts of France where the culture was established on a large scale, the value of the lands had been increased, and in many cases even had been doubled.

According to the present imperfect lights on this subject, we fear that the beet culture will not suit a region so warm in Eastern Virginia. But its introduction will be a benefit sufficiently important, even if confined to the regions lying more north and west. It is probable that the fanaticism of the "abolitionists" may be mingled with the motives to spread this culture in the north—and that one of the results may be an effort to lessen the consumption of sugar from the cane, as being a product of slave-labor. Be it so. This fanaticism cannot exert any part of its tremendous force more harmlessly to the south, or more beneficially to the north, than in promoting the extension of this new culture.

From the Northampton Courier.

SOIL AND CLIMATE FOR THE SUGAR BEET.

A friend who is conversant with the cultivation of the beet root in France, has furnished us with the following interesting outlines.

Of the seven varieties of the beet root usually cultivated, the *white* (beta alba) is preferred by the experienced manufacturer, as it is found to contain a larger proportion of the saccharine matter to a given weight of the root, than any of the others. Though this plant will grow in almost any soil, it prefers a deep loose loam, in which its long and tender fibres may penetrate and the root devolope itself without obstacle. It follows that a stiff compact soil should be avoided, and still more a low damp situation, where the root becomes so impregnated with aqueous parts, that the difficulty and expense of separating these would in most cases be far from remunerated by the produce. In high ground the beet succeeds well, if the season is not too dry, and in these situations (ceteris paribus) is more productive in sugar than elsewhere.

As to climate, a northern latitude is found to suit this plant best: the north of Germany, Prussia and Silesia, the countries where this new application of it was first made, are more favorable to it than even the northern departments of France, as experiment has amply established, and the trial of it in the south of France has constantly failed, though it was at first supposed that this root, favored by the genial sun of that climate, would, as well as its other productions, contain a larger proportion of the saccharine principle than those of colder countries. This hypothesis, founded on a mistaken analogy supposed to exist between plants growing above and below the soil, proved, as might have been expected, completely fallacious, and the culture there is now given up.

THE MARLY, OR GYPSEOUS EARTH OF GENESEO, N. Y.

The July No. of Silliman's Journal of Science, contains the article which was before published in our last No., (at page 187) describing a bed which the writer considered as simply an impure limestone, or a kind of hard marl, but which was sold and used as gypsum, and which, in fact, was found to produce similar and as remarkable effects as gypsum. In addition to the piece as sent to us in manuscript, and as published, this has another paragraph, which will be here inserted.

> "Mr. Moore's limestone formation is on a hill about five miles north-east of this village. In digging his well, the first three feet was common soil; the next three feet shelly, thin limestone, (this is a common covering of beds of gypsum;) from six feet from the top to twenty feet, which is as far as he has dug, it has the appearance at a short distance, of blue clay; it is brittle, and easily dug up with a pick, and consists of fossils in vast abundance, which would seem to have been interspersed originally with blue earth, which became indurated, and finally limestone. Among the specimens is a large piece of the blue clay limestone. Almost precisely similar formations have been found on several farms. I have never seen any thing similar to it, but am not enough of a geologist to describe it more minutely—one thing is certain, which seems to comprise the main chance, it is equal to the best plaster in its fertilizing qualities."

We had entertained and expressed the hope, that Professor Silliman would be able to dispel the mystery in which this interesting discovery was enveloped. But the strangeness of the facts does not seem to have excited much attention, and there is nothing added by the editor, except two short marginal notes—the first of which merely states of the shells found in the earth, that they are "chiefly *terebratulæ* of great distinctness and beauty"—and the other is in reference to the earth being described as effervescing with acid, and is as follows:—

> "Owing to a mixture of carbonate of lime with plaster of Paris, it is not uncommon that the latter effervesces. It is not difficult to decide which prevails. The substance being pulverized and mixed with diluted muriatic or nitric acid, will dissolve entirely, if it is a pure carbonate of lime; if there is a residuum, it may be plaster of Paris, or something else not soluble in the acids. The specimen sent to us by our correspondent was so treated, and indicated about half of carbonate of lime, without plaster of Paris, but with a large clayey residuum.—ED."

The only light thrown on the subject, by this note, is, that the gentleman to whose observation the public are indebted for this discovery and communication, was right in his opinion, that the lime in this formation was (not only principally, but) entirely, in the state of *carbonate*, and not of *sulphate of lime*, or gypsum, as supposed by others, and as its practical effects would seem to confirm. According to the constituent parts, as reported in the note copied above, the earth is simply a calcareous clay marl—and not even uncommonly rich as a marl. But there is no attempt to account for the wonderful fact, that this substance, used in the very small quantities usual with plaster, (say one bushel to the acre,) should produce as great effects, and so as to leave no doubt on the minds of those ignorant cultivators who judge merely from appearance, that this earth is truly gypsum, and of good quality. Increased importance is given to the subject by this expression of Prof. Silliman's opinion—whether it is considered as establishing the strange (and to us, incredible) fact, that this high fertilizing power is caused simply by carbonate of lime, and of course would be exerted by every calcareous marl similarly applied—or as otherwise, by showing that *no gypsum* is contained, that some other substance must be present, as yet undiscovered, which exercises the remarkable and peculiar powers of gypsum. The subject still needs, and well deserves, the most careful investigation by men of science. To our understanding, the matter is now darker than at first. With all the high opinions entertained for carbonate of lime as a fertilizer, we have not the slightest faith in its producing such effects as these—and according to the analysis of Prof. Silliman, there is not even the smallest ingredient of gypsum present, to which, (before his report, and without having seen a specimen of the earth,) we had attributed the effects produced by the application. We trust that the gentleman who has commenced this investigation will persue it, as he is well able to do, or to have done. Whatever may be the results, they will scarcely fail to lead to important agricultural profit, as well as knowledge.

EXTRACTS FROM PRIVATE CORRESPONDENCE.

Greene Co., Ala., Jan. 7, 1836.

I could say much of the value of your views on soils and calcareous manures, especially in this country, where poor sandy land is so indented by the lime land, and where it is quite common to find a single acre of prairie (always resting on the *rotten* limestone, at a few feet below the surface,) surrounded by those poor lands. These little prairies are frequently found interspersed at intervals of half a mile or a mile apart through these poor tracts of country, destitute of lime. What a field for judicious industry!

I did intend to communicate many facts respecting the black lands, but I find that you are as well acquainted with them as I am, by means of your correspondents who have anticipated all that I could say upon this subject.

Nashville, (Tenn.,) May 20th, 1836.

Though I have not yet perused completely your work, I have learned already so much from it, as to be convinced of its great utility for our agriculturists, and having lately travelled amongst them, I have not neglected to recommend it to those whom I found intelligent. I have particularly been pleased with the improvements of the farms in East Tennessee since they have commenced to use the plaster of Abingdon freely. I do not recollect to have seen the plaster of that part of your State mentioned in your works. It occurs near the salt-works of General Preston and King, and is of a better quality than any imported from Nova-Scotia or France. I was astonished that it was not in such general use in that part of Virginia which borders on Tennessee, particularly in Powell's valley, where the soil seems so well adapted to it.

[In the first published No. of the Farmers' Register, there was given a concise editorial notice of the purity and value of the gypsum of the region of Virginia above named, and other incidental references to it have since been made in several other articles. Still, for a matter so important to the wealth and improvement of Virginia and Tennessee, the subject has been much neglected, and it is not known to many of the people of Virginia, that so rich a mineral treasure exists within the State.]

WHEAT CROP IN THE NORTHERN NECK.

Westmoreland, Va., June 24th, 1836.

In making out your usual report of the state of the crops, it may be useful to know, that in this region the wheat has entirely failed. I have seen no field that will return the seed and defray the expense of harvesting. One of my neighbors, on a small, but very productive farm, on which he has usually made upwards of 1000 bushels, now offers his standing crop, from 87 bushels sowed, for 50 bushels of wheat. Another, who sowed 90 bushels on a very fine field, offers the crop for 40 bushels. My own crop, on land that has been highly improved with clover, sea weed, &c. is not in a much better condition. The severity of the winter and the ravages of the fly, had been very destructive, although where the land was highly improved or freshly manured, the wheat had in a great measure recovered; and my own crop would have been fully an average one, but for the late devastating rains, which have brought on mildew in its most fatal form. In the language of the Edinburgh Review, it has attacked the wheat with the violence of an *apoplectic stroke*—and scarcely one head in a hundred has escaped the paralysis. The weather for the last month has been precisely such as to produce mildew in its most aggravated form, and I am very confident that the disease is not local, but has extended to every part of the Union that has been reached by the late excessive rains. The author of the article on agriculture above quoted, in speaking of the failure of the crop in England in 1808, says if he had been in the West Indies, and had been informed that it had rained at a critical period of the season for nearly four weeks, he could have predicted with positive certainty the destruction of the wheat by mildew. The rain commenced here more than 4 weeks ago, and with the exception of a very few fair days, we have had almost constant rain since. The wind is now at N. E. accompanied with a heavy mist. Last night the rain poured down in torrents. The corn crop is of course in a very backward state, and upon wet lands, the prospect for a crop is gloomy indeed.

These few lines are written just before the close of the mail—and are not intended for publication in their present form, though the information contained is much at your service.

[The foregoing letter was received too late for our last No., and is now inserted, though "out of date," because its details and its reasoning serve to throw light on the general and disastrous circumstances of the present wheat crop. Though contrary to the writer's intention, we have preferred giving his facts in his own words: and though not at liberty to give the signature to a private letter, there could be none that would carry with it more respect and authority than that of our much esteemed correspondent.]

THE SEASON, AND WHEAT CROP.

We might fill pages with statements extracted from other prints, serving to prove the general failure of the wheat crop, in the greater part of the Atlantic States, and confirming, to the fullest extent, the view and anticipations presented at the close of our last No. as to the crops of Virginia. But it is unnecessary thus to occupy space, where there remains so little difference of opinion. There is now no doubt that the statement of general deficiencies then presented, before the wheat was reaped, was even more favorable than the crops of Virginia will realize. The gross product of the entire State, will not exceed (if it even equals) the third of an average crop, in quantity—and of that the quality is so inferior, that a new and important difficulty on very many farms, and in many entire neighborhoods, will be to obtain enough of sufficiently good seed for the next crop, It may be computed that one ninth part, *at least*, of an average crop would be required for seed—which will be equal to one third of the crop of the present year: and as the best grain must be saved for that purpose, the balance for the farmers' home consumption, and for market will be only two thirds of the present crop, or two ninths of an average crop—and that of the basest quality of what this crop offers.

The wetness of the season has been favorable only to oats on high land—but destructive even to that crop, which requires so much moisture, on low grounds, usually the most favorable to its growth. Neither corn, tobacco or cotton in Virginia, can be conceived in as good as an average state—and every thing (except our land, and the natural and neglected resources for its improvement,) is high priced, whilst the amount of agricultural products furnish most scantily the means for purchasing.

COMMERCIAL REPORT.

The month of July is usually the commencement of the dull season, which continues until October. The tobacco trade is, in Virginia, the only active one at present, and this does not exhibit its usual animation in the extent of competition and wide range of prices. The dull state of European markets, which has prevailed during the year, somewhat depresses the spirit of speculation; but the market has been steady at prices which amply remunerate the planter. The lowest sort of *refused* and lugs continues brisk at 5½ to 6½, and *passed* commands 7½ to 10 for export, while fancy qualities go considerably higher, but do not admit of quotation. The quantity now offering for inspection in Richmond is very large, and until the close of next month, it will be difficult to draw a parallel between the crops of the past and preceding years. At present there appears a considerable deficiency in Virginia, compared with the inspections of last year, and an immense increase in Kentucky is already ascertained.

The reports from various parts of the United States, generally agree in representing the wheat crop as having sustained more or less injury—the extent of which appears to be greatest in Pennsylvania, Maryland, Virginia and North Carolina—approaching in some parts of the country to almost a total failure. In New York and the western states, the injury is said to be less; but until the harvest is gathered, it will be difficult to judge correctly, if appearances are as deceptive there as here, where in many places the straw was luxuriant but the head grainless. The harvest in Virginia is certainly the least productive that can be remembered. No new wheat has yet been brought to market, nor can any price be quoted. So much of it will be lighter than the standard of merchantable wheat, that prices will probably appear low where the quality is not known. Flour has advanced to $7¼ to 7½, and would be higher but for the risk of keeping it through the summer. The mills near tide water in Virginia, must obtain supplies from abroad if they be kept long at work.

The cotton crop is nearly all at market. A few hundred bales per week arrive at New Orleans, and scarcely any at other ports. If the statements published be correct, the crop of last year will prove to be about 1,330,000 bales, or 75,000 more than the previous one. There is, however, an annually increased quantity taken into the interior for consumption, which cannot well be ascertained, and which would add to the quantity reported as manufactured in the United States. Prices in England declined in May and June. In this country they have advanced, particularly for fine qualities. Sales in Petersburg 14 to 17 cts.—In New Orleans 10 to 20 cts.

Money is not plenty, and stocks are low in Wall Street, the great theatre of operations, where the brokers play their game. Exchange on England keeps down to 7½ per cent. premium.

The money market is no doubt somewhat affected by the recent treasury circular requiring payments for public lands to be made in gold and silver. Whether any and what effects will be produced on the currency, and general interests of the country, by this new experiment, remains to be seen: something will no doubt depend on the extent of the evasions which may be contrived.

July 23rd. X.

ACCOUNTS AND COLLECTIONS.

When the second No. of our current (4th) volume was issued, bills were sent to all subscribers who were indebted for one or more previous volumes—and not to any one (unless on account of some mistake existing,) who owed only for the current volume. At a later time, all the same bills, which still remained due from subscribers in Virginia, have been placed in the hands of collecting agents, who will not be able to present them all, until nearly another year has passed. Experience had proved the propriety of making no exceptions to the general rules adopted in those respects—and therefore, bills have been sent by mail, and may be afterwards presented by a collector, to many individuals who certainly do not require such applications, and whose payments, heretofore usually most prompt, have been now delayed, merely from inattention. Our excuse to all such subscribers will be presented in the manifest necessity of pursuing the same general rule to all persons who are more than a year in arrear, without regard to the difference of causes.

The sending these bills has also served to make known, and to lead to our ready correction of some errors and over-charges which from several causes had existed in our accounts. Though we have not been able to avoid making mistakes and omissions in this respect, yet the plan of printing receipts monthly, affords to every subscriber a ready and sure mode of detecting and establishing errors: and whether made known by that or any other means, we will at all times thankfully receive notices of errors, and will readily correct them.

To subscribers at a distance from the limits of Virginia, it has not yet been in our power to make personal applications for payments of arrears: and no considerable inconvenience has thence arisen, inasmuch as our most remote subscribers, in the general, are the most punctual payers on the list. Against the very few among them who have not pursued this course, we have almost no remedy. Theirs are simply debts of honor. It is not probable that any other obligation can be brought to bear on them.

These remarks are designed more to explain our usage, and to prevent giving offence by its application in particular cases, than to quicken payments. Though the subscriptions for each volume, according to the published conditions, are due in advance, we are quite content if they are received at any time during the publication of that entire volume; and no bill is ever designed to be sent to a subscriber who is not more than a volume in arrear. But when bills must be sent, they are made to include all that is actually due, and of course embrace the current volume.

To the great majority of our subscribers we owe thanks for a remarkable and unusual degree of punctuality and promptness in their payments, in addition to all other evidences of their favor and kind support. It is believed that no other journal in the United States is better paid for, according to the number of subscribers, than the Farmers' Register. Many readers, not acquainted with such details, will be surprised to hear that a loss of at least one fourth of all subscriptions, is usual, and as little as most publishers can expect to meet with: and our brother publishers would be as much surprised to know how much better has been the character of our list. More than 1600 subscribers have either taken the first volume, or commenced in part of it: and of that number there remain less than 40 names of those who have not paid. Yet the work was sent to all applicants, without distinction as to their locality, and in far the greater number of cases, without payment being made at the time of subscribing for the work.

REMARKS ON THE PROPAGATION OF HYBRID ANIMALS.

To the Editor of the Farmers' Register.

In the first volume of your work, page 193, is an article on the influence of parentage on offspring in breeding animals, written by myself. While writing that article, I was much tempted to venture considerably farther into the regions of speculation. In concluding to do so now, I plead the apology contained in the first sentence of that communication: "The prejudice against speculation may be carried too far, in matters which have not attained to perfection." It was maintained, that, in order to form a new race of animals, the individuals composing it, must, from each of their parents, inherit the blood of two existing races. Many new races have, most probably, been thus formed, without regard to the principle on which success depends. A ram, for instance, of good breed, may have been introduced to a flock of a different one, and after several generations, allowing opportunity for both sexes to possess some of his blood, it may have been found, that distinctively a new race has been produced, essentially differing, both from the first progenitors, and the first direct or mongrel cross. If the principle be true, its benefits might be obtained, in most cases, without the liability of incurring the evils of breeding *in and in*. And the proper commixture of the two races experimented on, could be better settled by skill in the breeder, than when left to accident.

But my object at this time is to make some remarks on the subject of hybrids. It appears to have been ordained, that, as a general rule, these should not breed. The wisdom of this law of nature—as it prevents the extinction of original species and the filling the world with monsters—will be readily perceived. I can, however, see nothing outrageous in the supposition, that many new species may have been formed since the creation, and that many more may be formed. Economy in the use of means, shows so conspicuously in all the works of nature, that it requires no stretch of imagination to suppose, that the many species of plants and animals would hardly have been directly formed, when, possibly, the whole of them might be produced from two species of each genus. We find that hybrid animals discover no defect of sexual desires, and I do not think it violent to suppose, that these might lead to the production of offspring, were it not for some modification in the structure of their sexual organs, which might require peculiar circumstances to effect such an object. These circumstances I have supposed simply to be, that such animals should come into company with others similarly descended, but with parents of opposite sexes. I think it highly probable that procreation would ensue from an association of the female mule with the male hinny, and *vice versa*. We have indubitable evidence that hybrids do sometimes breed, and that Mr. Kilby of Nansemond has a mare mule which has produced two colts. (See vol. III. Farmers' Register, page 440.) Now, suppose this gentleman were to put the mule to an ass, and it should produce a colt differing in sex from the one now living, there is much reason to believe that a continuation of the mule as a distinct and independent species, might be kept up from the two colts thus produced. If Mr. Kilby should think proper to raise more colts from his mule, I think it probable that he would find them more hardy and serviceable when produced from the ass, than from the horse; the hinny—the progeny of the horse and the she-ass—being said to be a very delicate and useless animal.

Having failed in my attempts for many years, from a variety of accidents, to test the principle on which the foregoing speculation is founded, by using the different species of ducks, and finding that Mr. Kilby has it in his power to make a fair experiment, I have determined to submit the *notion* to you, to him, and, if you think proper, to the public, and am, sir,

Most respectfully,
Yours, &c.
A. B. C.

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PRICES CURRENT.

JULY 28, 1836.

PRICES OF STOCKS.	Par value.	Offered.	Asked.	Last sales.	Last dividend for 6 mos.
BANK—Virginia—per share,	100			118	4½
Farmers',	100	-		116	4
RAIL ROAD—Petersburg and Roanoke,	100		-	116¼	5 May 1st
Portsmouth and Roanoke,	50				unfinished
Chesterfield, ($ of capital refunded,)	100	-	-	120	
Richmond & Fredericksburg,	100	-	-	110	unfinished
Greensville & Roanoke,	100	-	-	112½	do.
Raleigh and Gaston;	100			No sales	do.
MANUFACTURING COMPANIES.					
Petersburg Cotton Manufactory,	100	120	121	119	6
Merchants' Do. old stock.	100	145	150	140	12
Do Do. new stock,	100	No sales		120	
Matoaca Do.	100			120	(new)
Richmond	100				
Manchester Do.	100				
Franklin (Paper Do.) Richmond,	100				
INSURANCE COMPANIES.					
Richmond Marine and Fire,	100			98	
Petersburg,	100	106		106	new.
EXCHANGE on England,		7½ to 8 per cent.			

COUNTRY PRODUCE	
Corn per bushel,	80 cents.
Wheat,	None in market
Flour, superfine (country,) old	$7 to $7 50
Cotton,	15 to 17
Tobacco,	$4½ to 12
Bacon, (hog round) per lb., Western	13.
do. Virginia	14.

TO CORRESPONDENTS.

The following communication have been received—*Remarks on the Agriculture of Norfolk County—A precocious cow—Practical effects of green sand and marl—Legislative action required in aid of agriculture—No. 1. Agricultural Professorship—No. 2. Board of Agriculture and Agricultural Tours—Comparative Experiments with the Osage Orange as food for silk worms—Remarks on the Geological Survey of the Eastern Shore of Maryland.*

Several of the above are in type, and were expected to appear in this No. but were delayed to admit pieces of more immediate and more transient interest.

TO OUR READERS AT THE SPRINGS.

☞ Our many subscribers and friends who are now at the various Medicinal Springs, are admirably situated to obtain agricultural information, and to prepare interesting communications for the Farmers' Register. May we count on any aid from this source that might be so fruitful?

BACK NUMBERS OF THE FARMERS' REGISTER WANTED.

For the purpose of furnishing complete sets to new subscribers, I will pay $5 each for copies of Vol. I. Farmers' Register, if complete, (with title-page; index, and list of subscribers,) and not materially defaced. If without the index and list of subscribers, $4.50 will be paid for the 12 numbers.

For any of the first 9 numbers of Vol. I., 50 cents each, will be paid—or (if preferred by the person offering them,) given in exchange, a complete copy of Vol. II., together with a copy of the Essay on Calcareous Manures. Of Nos. 10, 11, and 12, of Vol. I., the impression was increased, and they can be furnished at subscription price, by any who may desire to have them.

Complete and clean copies of the title-page and index of Vol. I., will be bought at 25 cents.

For any number not exceeding 15 copies of each of Nos. 7, 8, and 11, of Vol. III., 50 cents each will be paid, or if preferred, two different odd Nos. of Vol II.

The Nos. will be paid for, if delivered at the book store of Campbell & Ruffin, Petersburg, Va., or to the undersigned. If sent by mail, the cost and risk of the transmission, must be borne by the person sending them.

EDMUND RUFFIN

NOTICE.

GARDEN, FIELD, AND FLOWER SEEDS.—I am pleased to give notice to the Farmers and gardeners in this part of Virginia, that I have imported from England all variety of *GARDEN, FIELD AND FLOWER SEEDS* that grow best in that country, and have made arrangements with such Gardeners and Farmers in the United States to be supplied with such seeds as are best adapted to this climate. The greatest attention will be paid to the quality of seeds sold by me. In no case will they be sold until tested, (that is, their vegetating quality.) Every seed sold at my establishment will be warranted fresh and to vegetate; the money will be refunded if they do not.

My supply and assortment is more extensive than any other in Virginia—and will be sold at northern prices. I have now on hand about

300 Bushels Fresh ed Clover,

Which will be sold low. Also, Genuine ENGLISH WHITE CLOVER, FRENCH LUCERN, ENGLISH RAY or RYE GRASS, LAWN GRASS, ROUGH COCKSFOOT or ORCHARD GRASS, HERDS GRASS or RED TOP, FEATHER GRASS, TIMOTHY, TALL MEADOW OAT, FESCUE GRASS (fine for sheep,) SAINFOIN, MILLET, 400 oz. Genuine GAMA GRASS SEED, which will be sold low. Peas, Beans, Brocoli, Cabbage, Turnips, Beets, Carrots, Cauliflowers, Celery, Corn Salad, Cress, Cucumbers, Egg Plants, Kale, Leeks, Lettuce, Melons, Onions, Peppers, Pumpkins, Mustard, Salsify, Rhubarb, Spinage, Radish, Okras, Tomatoes, Parsnips, Parsley, and every other kind of GARDEN SEEDS that can be found in any establishment.

EIGHT THOUSAND Papers of the most splendid *FLOWER SEEDS* ever introduced in this country; at six cents per paper.

☞A Catalogue of seeds can be had upon application to

ROBERT S. BERNARD,
Druggist and Seedsman, Norfolk, Va.

Dec. 1, 1835—12*t*.

TERMS OF ADVERTISING ON THE COVER, OR ADVERTISING SHEET, OF THE FARMERS REGISTER.

For twelve lines across the page, $1 for the first insertion, and seventy-five cts. for each continuance. Any less space will be charged as twelve lines.

A deduction of one-fourth will be made from the foregoing prices whenever a payment of $5 or more is made in advance for one or more advertisements ordered. Notes or checks of either of the Virginia banks required in payment, if sent by mail, or such others as may not be under par in Virginia; and postage must be paid on all orders through the mail respecting advertisements.

Advertisements not marked for a certain number of insertions, will be continued till forbidden—unless discontinued at the choice of the editor.

No advertisement will be inserted unless either paid for in advance, or accompanied by a satisfactory order for payment on some responsible person in Petersburg or Richmond.

For those persons who especially desire their advertisements to be noticed by many of the most intelligent members of the agricultural interest in Virginia and the adjacent states, and by country merchants, there is no one medium of communication preferable to this publication. The Farmers' Register is received at the store of almost every country merchant in the eastern half of Virginia, and at many elsewhere, in this and other States.

CLOVER SEED, WAGONS, PLOUGHS, GROCERIES, &c.—250 Bushels Sapling and Mountain Clover Seed. Timothy, Burnet, Orchard Grass and Herds Grass Seed. Very Superior one and two-Horse Northern Wagons; Ploughs from several of the most approved Factories. Sugar, Coffee, Molasses, Tea, Preserved Ginger, Candles, Paints and Oils, Lime, Tar, Salt, Iron of every description. 50 casks of Pure Wine; 1,500 Segars; Soal, Upper, and Harness Leather; Iron and Brass Bound Buckets and Tubs; 150 tons best French Plaster, (part in the rock) Cooking Stoves; Seine Twine; Blankets; Cassinetts;—And a general assortment of Crockery, Hardware and Cutlery, &c. &c.—Now receiving and for sale by

READ, WOMACK & CO.

Farmville, Nov. 1, 1835.—12*t*.

CAMP & POPE,

COACH-MAKERS, Bank Street, Petersburg, Va., (nearly opposite the Virginia Bank,) have now on hand a large assortment of ready made *Coaches, Barouches, Raisees, Double and Single Gigs;* and will endeavor to keep a general assortment of all articles in their line. All orders in their line of business, will be thankfully received and promptly attended to. Repairing of all kinds done at the shortest notice, and on the most reasonable terms.

August 1, 1836.

Haller Nutt

THE

FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the improvement of the Practice,

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

VOL. IV. SEPTEMBER, 1836. No. 5.

And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." *Swift.*

PETERSBURG, VA.
PUBLISHED BY THE PROPRIETOR,
1836.

SUBSCRIPTION PRICE, FIVE DOLLARS THE VOLUME.

[*This publication consists of four sheets—postage for* 100 *miles or less,* 6 *cents—over* 100 *miles* 10 *cents.*]

LIST OF PAYMENTS FOR THE FARMERS' REGISTER, MADE BY SUBSCRIBERS, OR PURCHASERS, FROM AUGUST 1st, TO AUGUST 25th, 1836.

PAYMENTS FOR VOL. I.

William Cain	Hillsborough, N. C.
Jerome N. Bonaparte	Baltimore co., Md.

PAYMENTS FOR VOL. II.

Josiah Wilson	Norfolk co., Va.
Thomas D. Edmunds	Dinwiddie
R. M. Cunningham	Mecklenburg
James O. Breeden	Richmond
Francis K. Nelson	Albemarle
William L. Craven	do.
James M. Macon	Orange
George Morton	Culpeper
John A. Person	Greensville
G. A. Smith	Orange
Charles D. McIndoe	Petersburg
C. C. Stuart	Fairfax
Luke White	Petersburg
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Thomas C. Richardson	Sumpter, S. C.

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James O. Breeden	Richmond
Charles S. Morgan	do.
John Vanlew	do.
A. Robinson, jr.	do.
F. J. Smith	do.
Fleming James	do.
Joseph S. James	do.
Francis K. Nelson	Albemarle
P. Meriwether	do.
Wm. L. Craven	do.
Wm. S. Archer	Amelia
James M. Macon	Orange
Thomas Scott	do.
Wm. T. Banks	Madison
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R. A. Worrell	Petersburg
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Joseph S. James	do.
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Wm. S. Archer	Amelia
James M. Macon	Orange
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THE FARMERS' REGISTER.

VOL. IV. SEPTEMBER, 1836. No. 5.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

CLINE ON THE FORMATION OF ANIMALS.

To the Editor of the Farmers' Register.

Sir: It is not long since I returned from an agricultural excursion through some of the most interesting portions of England and Scotland. Being at Holkham, Norfolk, the seat of Thos. Wm. Coke, Esq. I met a large party of agriculturists whose attention was much devoted to the improvement of stock. Mr. Coke distributed, in small pamphlet form, a concise statement of the general principles by which he had for years been governed, in the selection and breeding of his stock—which is acknowledged to be among the finest in that country.

I was not so fortunate as to obtain a printed copy of the pamphlet, but subsequently procured a manuscript copy, which I place at your disposal, hoping you will give it an insertion in the Register, if you deem it worthy of being laid before your readers. P. H.

On the Form in General.

The form of domestic animals has been greatly improved, by selecting with much care the best formed for breeding; but, the theory of improvement has not been so well understood, that rules could be laid down for directing the practice. There is one point particularly, respecting which, the opinions of breeders have much varied, which is, whether crossing the breed be essential to improvement.

It is the intention of this communication to ascertain in what instances crossing is proper, and in what prejudicial; and the principles on which the propriety of it depends.

It has generally been supposed that the breed of animals is improved by the largest males. This opinion has done considerable mischief, and would have done more injury if it had not been counteracted by the desire of selecting animals of the best form and proportion, which are rarely to be met with in those of the largest size.

Experience has proved, that crossing has only succeeded in an eminent degree, in those instances in which the females were larger, than in the usual proportion of females to males; and that it has usually failed, when the males were disproportionally large.

The internal form of domestic animals has been much studied, and the proportions are well ascertained. But the external form is an indication only of internal structure. The principles of improving it, must therefore be founded on a knowledge of the structure and use of internal parts.

The lungs are of the first importance. It is on their size and soundness, that the health and strength of an animal principally depends: their power of converting food into nourishment, is in proportion to their size. An animal with large lungs, is capable of converting a given quantity of food into more nourishment than one with smaller lungs; and therefore, has a greater aptitude to fatten.

The Chest.

The external indications of the size of the lungs, are the size and form of the chest, the form of which should approach to the figure of a cone, leaving its apex situated between the shoulders, and its base towards the loins.

The capacity of the chest depends on its form more than on the extent of its circumference, for where the girth is equal in two animals, one may have much larger lungs than the other. A circle contains more than an ellipsis of equal circumference, and in proportion as the ellipsis deviates from the circle, it contains less. A deep chest, therefore, is not capacious, unless it is proportionately broad.

The Pelvis.

The pelvis is the cavity formed by the junction of the haunch-bones with the bone of the rump. It is essential that this cavity should be large in the female, that she may be enabled to bring forth her young with less difficulty.

When this cavity is small, the life of the mother and her offspring is endangered.

The size of the pelvis is chiefly indicated by the width of the hips, and the breadth of the twist, which is the space between the thighs.

The breadth of the loins is always in proportion to that of the chest and pelvis.

The Head.

The head should be small, by which the birth is much facilitated; the smallness affords other advantages, and generally indicates that the animal is of a good breed.

Horns are useless to domestic animals, and they are often causes of accidents. It is not difficult to breed animals without horns.

The breeders of horned cattle and horned sheep, sustain a loss more extensive than they may conceive; for it is not the horns alone, but also much more bone in the skulls of such animals to support their horns, for which the butcher pays nothing; and besides this, there is an additional quantity of ligament and muscle in the neck, which is of small value.

The skull of a ram with its horns weighed five times more than another skull which was hornless. Both these skulls were taken from sheep of the same age, each being four years old. The great difference in weight depended chiefly on the horns, for the lower jaws were nearly equal; one weighing seven ounces, and the other six ounces and three quarters, which proves that the natural size of the head was nearly the same in both, independently of the horns, and the thickness of bone which supports them.

In a horned animal, the skull is extremely thick. In a hornless animal, it is much thinner, especially in that part where the horns usually grow.

To those who have not reflected on the subject, it may appear of little importance whether sheep and cattle have horns or no; but on a very moderate calculation it will be found that the loss in farming stock, and also in the diminution of animal food, is very considerable, from the production of horns and their appendages. A mode of breeding which would prevent the production of these, would afford a considerable profit in an increase of meat and wool and other valuable parts.

The length of the neck should be proportioned to the height of the animal, that it may collect its food with ease.

The Muscles.

The muscles, and tendons which are their appendages, should be large, by which an animal is enabled to travel with greater facility.

The Bones.

The strength of an animal does not depend on the size of the bones, but on that of the muscles. Many animals with large bones are weak, their muscles being small.

Animals that were imperfectly nourished during growth, have their bones disproportionately large. If such deficiency of nourishment originated from a constitutional defect, which is the most frequent cause, they remain weak during life. Large bones, therefore, generally indicate an imperfection in the organs of nutrition.

On the Improvement of Form.

To obtain the most approved form, two modes of breeding have been practised; one by the selection of individuals of the same family, called breeding in and in: the other, by selecting males and females from different varieties of the same species, which is called crossing the breed.

When a particular variety approaches perfection in form, breeding in and in may be the better practice; especially for those who are not well acquainted with the principles on which improvement depends.

When the male is much larger than the female, the offspring is generally of an imperfect form. If the female be proportionably larger than the male, the offspring is of an improved form.

For instance, if a well-formed large ram be put to ewes proportionably small, the lambs will not be so well-shaped as their parents; and if a small ram be put to large ewes, the lambs will be of an improved form.

The proper method of improving the forms of animals, consists in selecting a well-formed female proportionably larger than the male.

The improvement depends on this principle, that the power of the female to supply her offspring with nourishment, is in proportion to her size, and the power of nourishing herself from the excellence of her constitution.

The size of the foetus is generally in proportion to that of the male parent, and therefore when the female parent is disproportionably small, the quantity of nourishment is deficient, and the offspring has all the disproportions of a starveling.

But when the female from her size and good constitution, is more than adequate to the nourishment of a foetus of a smaller male than herself, the growth must be proportionably greater.

The larger female has also a greater quantity of milk, and her offspring is more abundantly supplied with nourishment after birth.

To produce the best formed animals, abundant nourishment is necessary from the earliest period of its existence until its growth is entire.

It has been observed in the beginning of the paper, that the power to prepare the greatest quantity of nourishment from a given quantity of food, depends principally on the magnitude of the lungs to which the organs of digestion are subservient.

To obtain animals with large lungs, crossing is the most expeditious, because well formed females may be selected from a variety of a large size, to be put to a well formed male of a variety that is rather smaller.

By such a method of crossing, the lungs and heart become proportionably larger, in consequence of a peculiarity in the circulation of the foetus, which causes a larger proportion of the blood under such circumstances, to be distributed to the lungs, than to the other parts of the body, and as the shape and size of the chest, depend on that of the lungs, hence arises the remarkably large chest which is produced by crossing with females that are larger than the males.

The *practice* according to this principle of improvement, however, ought to be limited, for it may be carried to such an extent, that the bulk of the body might be so disproportioned to the size of the limbs, as to prevent the animals from moving with sufficient facility.

In animals where activity is required, this practice should not be extended so far as in those which are intended for the food of man.

On the Character of Animals.

By character in animals is here meant those external appearances by which the varieties of the same species are distinguished. The characters of both parents are observed in their offspring, but that of the male most frequently, predominates. This may be illustrated in the breeding of horned animals, among which there are many varieties of sheep, and some of cattle, which are horned.

If a hornless ram be put to a horned ewe almost all the lambs will be hornless, partaking of the character of the male, more than of the female parent.

In some counties, as Norfolk, Wilkshire, and Dorsetshire, most of the sheep have horns. In Norfolk, the horns may be got rid of by crossing with Ryland rams, which would also improve the form of the chest and the quantity of the wool.

In Wilkshire, and Dorsetshire, the same improvement might be made by crossing the sheep, with South-down rams.

An offspring without horns might be obtained from the Devon cattle, by crossing with the hornless bulls of the Galloway breed. This would also improve the form of the chest, which the Devons are often deficient in.

Examples of the good effects of Crossing the Breed.

The great improvement of the breed of horses in England arose from crosses with the diminutive stallions, Barbs, and Arabians; and the introduction of Flanders mares into this country, was the source of improvements in the breed of cart horses.

The form of swine has also been greatly improved by crossing with the small Chinese boar.

Examples of the bad effects of Crossing the Breed.

When it became the fashion in London to drive large bay horses, the farmers in Yorkshire put their mares to much larger stallions than usual, and thus did infinite mischief to their breed by producing a race of small chested, long legged, large headed, worthless animals.

A similar project was adopted in Normandy to enlarge the breed of horses there, by the use of stallions from Holstein, and in consequence the best breed of horses in France would have been spoiled had not the farmers discovered their mistake in time, by observing the offspring much inferior in form to that of the native stallions.

Some graziers in the Isle of Shepley conceived that they could improve their sheep by large Lincolnshire rams, the produce of which was however much inferior in the shape of the carcase, and the quality of the wool, and their flocks were greatly injured by this attempt to improve them.

Attempts to improve the native animals of a country, and by any plan of crossing should be made with the greatest caution for by a mistaken practice extensively pursued irreparable mischief may be done.

In any country where a particular race of animals has continued for centuries, it may be presumed that their constitution is adopted to the food and climate.

The pliancy of the animal economy is such, as that an animal will gradually accommodate itself to very great vicissitudes in climate and alterations in food, and by degrees undergo great changes in constitution, but these changes can be effected only by degrees, and may often require a great number of successive generations for their accomplishment.

It may be proper to improve the form of a native race, but at the same time it may be a very injudicious attempt to enlarge the size.

The size of animals is commonly adopted to the soil which they inhabit. Where produce is nutritive and abundant, the animals are large, having grown proportionally to the quantity of food which for generations they have been accustomed to obtain. Where the produce is scanty the animals are small, being proportioned to the quantity of food which they are able to procure—of these contrasts the sheep of Lincolnshire, and of Wales, are examples. The sheep of Lincolnshire would starve on the mountains of Wales.

Crossing the breed of animals may be attended with bad effects in various ways and that even when adopted in the beginning on a good principle; for instance, suppose some larger ewes, than those of the native breed were taken to the mountains of Wales and put to the rams of that country—if these foreign ewes were fed in proportion to their size, their lambs would be of an improved form, and larger in size than the native animals; but the males produced by this cross though of a good form would be disproportionate in size to the native ewes, and therefore, if permitted to mix with them, would be productive of a starveling illformed progeny. Thus a cross which was at first an improvement would by giving occasion to a contrary cross ultimately prejudice the breed.

The general mistake in crossing has arisen from an attempt to increase the size of a native race of animals, being a fruitless effort to counteract the laws of nature.

The Arabian horses are in general the most perfect in the world; which probably has arisen from great care in selection and also from being unmixed with any variety of the same species; the males therefore have never been disproportioned to the size of the females.

The native horses of India are small but well proportioned, and good of their kind. With the intention of increasing their size the India company have adopted a plan of sending large stallions to India. If these stallions should be extensively used, a disproportioned race must be the result, and a valuable breed of horses may be irretrievably spoiled.

From theory, from practice, and from extensive observation, which is more to be depended on than either, it is reasonable to form this.

Conclusion.

It is wrong to enlarge a native breed of animals, for in proportion to their increase of size they become worse in form, less hardy, and more liable to disease.

From the Silkworm.

SILK CULTURE PROPOSED AT CAPE FLORIDA.

Cape Florida Light-House, April, 15, 1836.

Sir,—I have lately seen a publication entitled the Silkworm, published under your direction; and supposing you interested in the successful cultivation of the article to which it is directed, I take the liberty, although a stranger, to address you a few lines—not for the purpose of furnishing you with any additional information on the subject—but merely, through your paper, to call the attention of the public (or that portion of it who feel an interest in the manufacture of *Silk*) to Cape Florida, as a part of our country best calculated for the production of this article. I have, for the last eleven years, resided at this establishment, as keeper of the light-house and revenue or custom-house officer for this collection district. I have it therefore in my power to speak correctly, as to the climate, the lands in the neighborhood, and their fitness for the propagation of the silkworm, the rearing of the Mulberry trees, and the manufacture of silk.

My present residence is on an island, near Cape Florida, distant six miles from the main. The soil is altogether sand and gravel, on which no vegetable can be raised.* My family, amounting to near twenty, have for the last eleven years been altogether strangers to fevers, or disease of any kind; indeed, I may with truth assure you that there is no spot in America, where a settler can with more certainty calculate on the enjoyment of uninterrupted health, than at this place, and the immediate neighborhood. During the period mentioned (say since 1825) I have never seen a frost on this island. I have around my dwelling near twenty mulberry trees, which have grown to a large size. I have also several young trees of the *morus multicaulis*, which appear so little affected by the winter that they do not even cast their leaves. I have on the main, immediately opposite this place, a farm on which I have collected a number of tropical fruit trees. There are now on it 1000 banana, and about 500 plantain trees, in full bearing; and with the exception of the winter of 1834, they have never been affected by the cold. At this place the *morus multicaulis* has been planted, and thrives well; and I will venture to assert that their growth has been far more rapid than it would have been in a more northern situation. As a proof of this, allow me to state, that on the 23d of December last, I cut off six small limbs or twigs, from a tree of the *multicaulis;* they were stuck into the ground, and were not again seen by any one, until last week. I then found, notwithstanding the lateness of the season, that they had taken root, and had become thriving little shrubs and full of leaves.

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* The next paragraph shows that the writer means the *smaller* vegetables, and not *trees*.—Ed. Far Reg.

I have thought it necessary to enter into these details for the purpose of bringing the question fairly before you, and by this means submitting it to the consideration of those men at the north, who are disposed to enter into the manufacture of silk, whether it cannot be attempted with more certainty of success at Cape Florida than in any other part of the United States. I am myself disposed to enter into the business, and would willingly join any gentleman possessed of a small capital. My lands and fences are now in a situation to receive the trees for planting. I have only one doubt on the subject, and I will candidly state it. I have never been able to obtain any of the eggs of the silkworm, and therefore cannot determine myself whether the moschetoes, which swarm here from the first of May to the first of November, will or will not kill the worms. Our trees and shrubs during the summer are covered with small worms: on these the moscheto has no effect; and I am disposed to believe that sufficient precautions could be used for their preservation. It will afford me pleasure to give all the information in my power to any one feeling an interest in the subject.—Letters directed as below will be attended to.

In conclusion, allow me to inquire, if the citizens of the north can with any prospect of success embark in the manufacture of silk, and in a country where the worms cannot live or be propagated for more than four months, how much more profitable would it be at Cape Florida, where the winters are sufficiently mild to allow the trees to retain their leaves through the year, and when the worms would be raised every month in the year.

If you can do it I should be glad if you would send me a few of the eggs as a trial.

Very respectfully, sir,
Your most obedient servant,
JOHN DUBOSE.

From the New England Farmer.

TO FATTEN FOWLS OR CHICKENS IN FOUR OR FIVE DAYS.

Set rice over the fire with skimmed milk, only as much as will serve one day. Let it boil till the rice is quite swelled out; you may add a teaspoonful or two of sugar, but it will do well without. Feed them three times a day, in common pans, giving them only as much as will quite fill them at once. When you boil fresh, let the pans be set in water, that no sourness may be conveyed to the fowls, as that prevents them from fattening. Give them clean water, or the milk of rice, to drink; but the less wet the latter is when perfectly soaked the better. By this method the flesh will have a clear whiteness which no other food gives; and when it is considered how far a pound of rice will go, and how much time is saved by this mode, it will be found to be cheap.

THE BEE MARTIN AND HAWKS.

Extract from the Genesee Farmer.

There is another class of birds, such as the Martin and Kingbird, which have been generally placed among the depredators, and warred upon accordingly. The complaint against these is not that they destroy the corn, or infest the grain fields or fruit orchards of the farmer, but that they destroy the honey bee. It has been the opinion of some writers on natural history, that this was not the fact; they have believed that the kingbird, [bee martin] for instance, fed only on the drone; but since the subject was agitated in the Farmer a year or two since, by Thomas and Allen, we have shot some for the purpose of examination, and found that, though the contents of the stomach mostly consisted of the large ox and horse fly, and the drone, there was now and then a real working bee that had fallen a prey like the others. This fact however has not satisfied us that he should be proscribed; on the contrary, we think these birds do far more good than hurt, and are worthy of protection. So far as we are concerned, they are welcome to now and then a working bee, so long as they will make such havoc among the drones and the ox or horse fly; and we are always glad when we see the kingbird constructing his nest on the premises, considering it a proof that no hawk will be allowed to forage around the barn-yard with impunity.

Although as a farmer we have placed a black mark on the hawk family, we consider the scale of good and evil nearly balanced in their case; and think that the loss of a stragling chicken now and then is nearly or quite compensated by the slaughter of some scores of weazels, snakes, and mice, in the course of the year. We accordingly treat the hawk on the let-us-alone principle, rarely putting ourselves much out of the way to kill them, so long as they pursue their legitimate way of getting a living, and do not become intrusive.

IMPROVEMENT OF WORN LAND.

To the Editor of the Farmers' Register.

I submitted some reflections on the improvement of worn land some time since, with the determination that I would persevere in the attempt to improve my own farm, one of the first settled in my county.

I have advanced, as I said I would, step by step. The thin land, such as would produce not more than a barrel of corn to the thousand hills, I have been manuring for tobacco, and last year made a respectable crop on such land. It is a soft free land, and susceptible of improvement. At the fall, the land was sown in wheat, and in February, in clover; the crop of wheat is good and the clover very promising.

A piece of land adjacent managed in the same way the year before, a part of which was very much exhausted, has produced an excellent crop of clover, much mixed with herd's grass, (the product of seeds brought in manure from the stable.)

I am now perfectly satisfied that our exhausted lands may be restored to their original fertility; and so confident I am in the success of the undertaking, that it is a matter of choice to pitch a part of my tobacco crop in such land every year. Indeed, if we were to change our system, and cultivate all of our highly manured tobacco lots in grain and grass, we should do what is but sheer justice to our native land. Tobacco mainly killed the soil, and tobacco is justly chargeable with the expense of restoring it.

The improvement of land for corn to much extent, is not to be expected in the present circumstances of the country. Tobacco is the staple crop, and all the manure that can be raised is in requisition for the tobacco land. Now, if the thinner land is manured, and cultivated in tobacco, I feel no hesitation in saying (preposterous as the advocates for manuring the richer lands may think it,) the product will be in favor of the poorer land. The tobacco will be respectable, the wheat, and clover following, luxuriant, and the land raised in value 200 per cent.

The manuring of such land should commence early in the fall, covering the land with leaves, or such litter as can be conveniently had, in addition to which, the stable or farm-pen manure is indispensable. The first manuring will then be effectual, putting the land in heart for what is to follow.

In these remarks, I wish not to be understood as recommending the improvement and cultivation of the most exhausted land, to the neglect of a better subject for improvement. Any lands that are turfed and would produce more than a barrel to the thousand hills, would certainly be preferable, requiring less manure. The opinion is fast gaining ground, that lands that have long been abandoned as commons, and grown up in pines, &c. if taken up and judiciously managed, produce the finest tobacco. The reason is obvious; these lands were originally the richest; our fathers cleared their best lands first, and as in all new countries, supposed they could not injure them by cultivation. The same system is progressing in Mississippi, and the same result may be expected.

Several of my neighbors have tobacco in lands that produced little or no corn when last cultivated; the lands have been manured by no means heavily, and from present prospects, the tobacco promises to be good. They covered the land with leaves in the fall and winter.

The improvement of land will advance with the facilities of intercourse; roads, canals and the navigation of the rivers, are now receiving more attention. The public highways are under the management of the county courts, and to improve them systematically, the Legislature has wisely thrown the responsibility on each county to make such improvements on such roads as they may think proper. May we hope they will use the power granted for the good of the Commonwealth? Will the people shrink from a public duty wisely imposed on all males of sixteen, and under sixty? I cannot think they will.

Virginia presents a wide field for all the improvements of the day. It is a dear land to all her sons. The traveller to the distant west, can tell his own feelings best, when after a long and wearisome journey he enters on the Old Dominion: his Virginia feelings are awakered, his attachment is renewed, and all his speculations become insignificant, when he thinks of having to leave his native land; but restless spirits must and will go—"there is much land to posses," the land was made to be peopled, and so let it be.

But to the question—What is gained by removal to the west? A man who has a large and expensive family, desiring to settle his children, may, for the sake of them, meet the sacrifice of the conveniences of an older country, his own comfort, and go. But can he look at the expense of building such houses as he will leave, and clearing the heavily timbered lands of the west, and not see that the same amount expended in improving a good old Virginia estate would be as profitable? It is estimated to cost about $10 to clear an acre of land in the west; add to this the lowest price per acre, $1 25, and then erect such houses as a permanent settlement requires, and you have the cost of a western estate.

Has it occurred to many readers of the Register, that it is about as easy to improve an acre of land as to clear one? The felling of timber, grubbing the undergrowth, mauling rails to fence the land, the coultering and putting in order new land for a crop, consumes more time than to litter the same quantity with such means as may be had on most farms. *It is worthy of experiment.*

The friends of agriculture have much to encourage them; they should renew their diligence and utterly disregard the sneers of those who ridicule all improvement. The grand canal of New York, with the able Clinton at the helm, was considered a most preposterous undertaking. Clinton was driven from the distinguished station of Commissioner, but the work went on, was accomplished, and serves as a monument to perpetuate the fame of its projector. Yes, a more durable monument than the pyramids of Egypt, or such an one as is proposed to honor the immortal Washington; a structure to look on, rather than to answer any useful end, more to signalize the folly of the people, than to honor him who has all honor, who will live forever in the memory of a grateful people, without the adventitious aid of a sculptor or painter.

A system of improvement simple and practical, the community demands; and if, sir, the Register should be the instrument of setting in motion, (as I believe it will,) the real improvement of this once fertile Old Dominion, the state will remember the efforts on your part to accomplish the end in view.

S. D. M.

MINERAL MANURES.

[Continued from page 249.]

Application of marl.

Many farmers either lay marl upon land sown with tares, thus making a bastard fallow; or they apply it to grass land, or to a clover ley, to be broken up in the following year. The latter is certainly the preferable, as well as the most general practice, for it not alone produces an abundance of good pasture, but it affords time for the season to operate in bringing the marl into a fit state for future tillage crops, which cannot be done in the common course of cropping, because it becomes buried by the plough before it is properly mixed with the soil, especially if turned in deep the first earth. It should, therefore, be allowed sufficient time to sink and eat itself into the the surface before it is ploughed up. This, however, is by some persons carried to an absurd length, as they occasionally spread a coat of marl upon the green sward, and leave it there unploughed for many years, in which case the grass receives considerable detriment, for the marl then sinks downwards in a body, without incorporating with the soil; though, when it has lain a long time in this state, the subsequent crops of corn have been found to be enormous*. If laid upon grass, it may be carried out during all periods of the year in which the crop is not in a forward state of growth; but if applied to arable land intended for immediate cultivation, the months of June and July, or soon after the autumn seed-time are considered the best for its application. If laid on a short time previous to winter, its effect is also generally prompt, because, except it be of a very tenacious kind, the action of the cold and rain commonly divide it in time, to be thoroughly amalgamated with the soil by the tillage of a summer fallow. If however, it be only applied during the spring months, this cannot be so properly carried into execution, for it requires the winter's rain and frost to crumble it, and it consequently has but little power upon the year's crop. A complete summer fallow is, undoubtedly, the best mode of bringing it into perfect operation: but not only is the expense often objected to, but there is also a strong prejudice entertained by many persons against fallowing—into which it is not our present object to inquire, although we necessarily shall have occasion to notice it hereafter.

It is almost superfluous to add, that, in whatever manner it be applied, it must be equally spread over the land; and if there should be any large lumps remaining, these should be broken with mallets, or clotting-beetles, in the same manner as chalk, before it is ploughed in. This, however, is not usually done until the marl has partaken of both one summer's sun and one winter's frost; and should the previous season have proved unfavourable to the reduction of the marl to small particles, the process, in some cases, costs so much, that, when laid upon grass or clover, it is often found more advisable to leave the ground unbroken during another year. Then, when well crumbled, dry weather should be chosen for rolling and harrowing it—a first time with heavy rollers and drags, and a second, after it has been exposed to rain, and has been again dried: in short, until it has been rendered as small as possible; after which it should be lightly ploughed in, again harrowed, and receive from two to four ploughings, according to the condition of the soil. The intermixture of the marl with the earth cannot, in fact, be too complete; for whatever proportion remains uncombined with the soil, will not alone fail of producing the intended effect, but will have one of an opposite and prejudicial tendency.

The *quantity of marl* which it may be prudent to apply to the land depends entirely on the nature of the soil, and the properties of the marl: the more calcareous is the latter, the greater is the effect which it will produce, as a stimulant; and shell marl possesses, besides, the additional power of nourishing the soil by the vegetable and animal mould with which it is combined. This species was formerly profusely used on every sort of ground, but at present the average amount applied to land of the medium kind is from 30 to 40, or, if it be very light, only 25 cartloads, of 16 cubic feet per acre. Land of the latter quality may, indeed, be readily over marled; as by repeated marling, in large quantities, the surface of poor ground may be rendered so loose that, in some cases, it has not afforded a sufficient hold to the roots of corn and grass*. Double the quantity may, however, be laid upon strong cohesive soils, for it is not so easy to give them too large a dose; but if cold, wet, or moorish, great circumspection is requisite in the application of this marl, for if the land be not previously well drained, it will only increase its tenacity.

The earthy marls, if much mixed with clay, are only fit for light soils; and, if applied to them, the quantity must be increased in proportion to the deficiency of calcareous matter. When of good quality, containing about 20 to 25 per cent. of calcareous or chalky substance, they are commonly laid upon such land to the thickness of an inch; which will require 135 cubic yards, or about 200 single-horse cart-loads per acre†. sandy marl, though generally more calcareous; yet being dug up with less labour, is often used upon clays with greater freedom; and we have already seen the great extent to which stony marl is sometimes applied‡. In many parts, however; where the effects of marl have been extensively experienced, these quantities have been diminished one-half, with nearly, if not entirely, the same immediate effect upon the crops, though its power has been less durable, and has in most cases altogether ceased at the end of at most a dozen years; but, then, it admits of the following advantages—a farmer may be able to afford half the expense, when the whole amount may be beyond his means; or, at the same time, he can marl double the extent of land, and he can reap all the probable benefit within the term of a moderate lease. Nor is this all; for, supposing him to have the freehold—it has been found, that when large quantities of marl have been laid upon the land, though its effects last longer, yet, unless cultivation be carried on with great intelligence and care, these are at length worn out, and by severe cropping to repay the expense, large tracts of marled land have been much exhausted. In such cases, too, a second application has been attended with very little benefit; whereas, when it has been laid on in moderate quantities, a second and further applications have been successful; the reason of which evidently is, that, in the first instance, the fertility of the mould was either exhausted by the chemical effect of the marl, or that, the soil being of a heavy kind, and the marl containing too great a proportion of clay, this addition became injurious; while, in the second, dung had been applied in aid of the marl, or, its earthy properties being of a nature opposed to those of the soil, assisted in its amelioration. The latter of which supposition is, indeed, supported by the fact, that when a second application of clay-marl has failed, lime has been laid upon the same land with sensibly good effects[*].

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* Dickson's Original Report of Lancashire, Stevenson's edit., p. 490

* Perth Report; and Appendix to that of Cheshire, No. 3.

† Clay-marl is not uncommonly laid upon light soils to the extent of too roods, each containing 64 cubic yards; but on heavy land, half that quantity per acre is considered a good covering.—Cheshire Report, p. 222.

‡ See p. 308. Throughout many parts of Scotland it is applied at the rate of 200 to 300 small cart-loads per Scotch acre,—equal to 160 to 240 per imperial acre. It is there commonly applied to grass land, and allowed to remain one or more winters on the surface, until completely reduced by the frost.—Survey of Morayshire, pp. 21-320; Forfarshire, p. 407.

It has also been observed, in those places where marl is applied to the land in small quantities at stated distances of time, and where a sufficiency of dung is likewise used, that when weeds of any peculiar species push forward with extraordinary vigour, marl, if accompanied by a clean fallow, not only destroys them, but produces better corn than when dung has been laid on alone, though also upon a fallow, and instead of marl; which has been thought to be accounted for by the exuberance of the weeds proving that the soil is already abundantly furnished with nutritive matter for the promotion of vegetation, but that it is more appropriate to the production of the weed with which the ground is covered, than to cereal crops: whence it has been inferred, that the chemical action of the marl probably changes the nature of the mould.[†]

The *durability of the effects of marl* necessarily depends upon its power over the soil. A very large dose of argillaceous, or clayey marl, ameliorates sandy soils to such a sensible degree by the consistence which it affords to the land, that, if proper attention be paid to its complete combination with the surface, and to the prevention by careful culture of its sinking to the subsoil, as well as to the employment of putrescent manure, the improvement thus effected will be found permanent. When laid on in smaller quantities, its effect and duration will, on those light soils, of course, be proportionate; but on clays, as its chief power consists in the calcareous matter which it contains, its greatest effect is apparent when the land is brought into the second course of tillage, after which it gradually begins to decline, and after six or eight crops have been grown, it usually ceases to operate. No rule can therefore be laid down for its value among tenants upon a change in the occupation of the land, and it can only be estimated by the opinion generally prevalent throughout those parts of the country where it is used.

It is extensively employed throughout Cheshire, Lancashire, Shropshire, Staffordshire, and most of the midland counties, in almost every part of which it is found, but in the greatest abundance where the prevailing soil is a clay, or a clayey loam. It is there generally red, dark brown, or bluish-grey, intersected with veins of light yellow, of a greasy touch when moist, and friable when dry: the land where this species of marl forms the subsoil is likewise very commonly found to be of first-rate quality. There is also an excellent kind of marl sometimes met with, which is vulgarly called *dove-dung*, from resembling that of pigeons. Under sandy or mixed soils it is also very frequently met with, but usually at a more considerable depth. It is sometimes laid on the green sward in winter; and after being acted upon by the frost, is ploughed in the following spring, usually for oats. If, however, allowed to lie for twelve or eighteen months, it will have a still better effect; for the successive changes of the atmosphere moulder it down, and the roots of the grass combine it with the surface of the ground, by which means it becomes more beneficial to the following crop than if stirred immediately by the tillage of a fallow[*]. Marling on fallows is, however, practised to a very considerable extent, and is there found generally productive of great benefit to the soil. It is spread, immediately after being carted, upon the land, but its pulverization is left almost entirely to the atmosphere. Some kinds are much more easily reducible to a powdery state than others, and the difference determines, in many instances, the propriety of their respective application. On the stiff clay lands, or where immediate crops are the direct object of marling, those marls which pulverize with the greatest rapidity on exposure to the weather contain the largest portion of calcareous matter, and are, therefore, found the most beneficial. On light sandy soil, or where marl is employed with a view of producing durable effects, the more tenacious kinds may also be used with even greater advantage. Under the latter mode of application, the effects produced on the soil are not, indeed, evident until after repeated ploughings, and they frequently continue to manifest themselves during a long period.[†]

There is, however, a bad sort of red clay-marl, as well as a kind of brown shining clay, sometimes mistaken by farmers for marl, which, having been dug out of almost every field, and laid during many ages on some heavy soils, has increased their tenacity, and rendered them less fit for the purposes of agriculture. Its effects are, indeed, so apparently unfavourable, that its further use has been prohibited to the tenantry on the estates of the Duke of Sutherland, in Staffordshire and Salop, and a distinct line in the appearance of the crops now points out with precision the land which was formerly so treated. Of this fact all the intelligent part of the tenantry are themselves convinced, though some are still so wedded to their old customs, that they lament the regulation which excludes its use[‡].

Marl is, also, generally used in Norfolk, in which county it is found of better quality, and of easier access, than in most other parts of the kingdom. By Mr. Blaikie, it is described as having a hard, dry, and slaty appearance, when first dug from the pit, and possessing about the same proportion of lime as the Norfolk clay, which contains a large proportion of calcareous earth; the only difference between them seeming to consist in the one being a little more friable than the other; so that they are very commonly confounded,—'one practical man calling that substance clay, which another, equally conversant in such matters, terms marl*.' By other persons, another species is mentioned as a white, pure, calcareous substance, like chalk, though sometimes streaked with yellow, but fat and unctuous. When found of any other color, it is, indeed, said that farmers can scarcely be persuaded that it is marl; but although this kind possesses greater purity than the former, yet there are many other sorts of very strong quality. On its first discovery it was seldom laid upon the land at a less rate than from 80 to 100 loads, each containing as much as a wagon with three horses could draw, and its effects were found to last, on some soils, full twenty years. This system has, however, been latterly corrected, and the quantity now laid upon the land does not usually exceed 40 to 50 tons per acre. It imparts tenacity to the soil, and where that is composed of a mixture of sand and loam, or of sand and gravel, it causes great improvement; but on land of so loose a texture as to consist almost wholly of sand, it has been found, in the course of years, to form a retentive subsoil, which has proved injurious. It has, indeed, been shown, in some instances, that on land of the latter description, clay has had a better effect.

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[*] Berwickshire report. Naismith, on Manures Cen Report of Scotland; App. vol. ii. p 75.

[†] Thaer, Principes Raisonnes d'Agriculture, 2de ed. tom xi. p. 415.

[*] Arthur Young's Essay on Manures, in the Papers of the Bath and West of England Society, vol. x., p. 106,

[†] Holland's Survey of Cheshire, p. 238.

[‡] Loch's Account of the Improvements on the Estates of the Marquis of Stafford (now Duke of Sutherland), p. 190,

In the earliest stages of improvement in the Norfolk husbandry, some farmers, from experiencing the evils of a want of firmness in their poor sands, marled at the rate of 120 to 150 cubical yards per acre; the consequence of which was what they call *setting:* the firmness was produced, but at the expense of the friability of the soil, which was thus rendered too tenacious, so that it is at present found preferable to give a moderate dose at first, and to repeat it at a future period. This prejudicial effect, arising from marl, is very remarkable; for the clay, sand, and lime of which it is composed would not, if thrown promiscuously over a field, produce the same effects; and when laid upon the land, they indicate no improper proportions, nor any which are not found in very rich soils. It may, therefore, contain other ingredients which have not yet been detected by chemists; and, as has been imagined—perhaps not unjustly—by Arthur Young, 'it arises from the addition not being so well assimilated with the sand, as in soils of a natural texture it is rather a mixture than an incorporation.'† There is, indeed, reason to suppose that marl derives much of its beneficial qualities, as a manure, rather from the complete amalgamation of the various substances of which it is composed, than from any other cause.

Mr. Marshall, in his Rural Economy of Norfolk, enters into a chemical investigation of the nature of the marls, which, though too long for insertion here, is well worthy of attention; in which he describes that of the white, or rather yellow kind, as one of the best and most lasting species of fossil manures. Twelve cart-loads—according to his account—change the nature of the land in the second year after it is laid on; and most of the exhausting weeds which impoverish the soil, and choke the corn in its infancy, being effectually destroyed, it consequently has a great tendency to keep the land clean; also bracing the pores of the earth, and increasing its fertility to a surprising degree. Its benefits, he says, are felt throughout full thirty years; when a second marling of about half the original quantity may with propriety be used; but it has been found, by experience, that it does better the second time, if applied as a compost with earth of a sort different from that of the soil on which it is laid; or with mud, and more especially with dung. To this it may also be observed, that lime is not unfrequently added; though, as lime and marl both partake of the same properties, the mixture of the former only has the effect of strengthening the compound.

It thus appears that not only do the species of marl vary in several parts of the kingdom, but in some parts there are kinds which, though seemingly quite distinct from each other, have yet been found, on trial, to possess precisely similar qualities; for we learn that experiments on a considerable scale have been tried in the New Forest, in Hampshire, on three different sorts, dug out of the same pit, namely,—yellow, at about four feet below the surface, blue in the middle, and shelly-marl underneath; and yet, although from all the accounts which have been received of the latter, its properties are superior to those of the two former, still, in these instances, no other difference was observable in the crops during many years, except that the shell-marl rendered the land rather the most friable*.

That marl materially benefits land on which it is judiciously used, admits of no kind of doubt. Much difference of opinion is, however entertained respecting the manner in which it operates—most farmers conceiving that its only value consists in the calcareous matter with which it is combined; others, that its principal advantage arises from the bulk and consistency which it imparts to the ground; and some, that the improvement which it occasions is chiefly owing to its mechanical action on the texture of the soil. Upon an attentive consideration of the subject, it will, however, appear, that a certain portion of its utility as a manure is derived from each of the three sources which have been assigned. With regard to the calcareous earth of which it is partly composed, it clearly possesses, in extent equal to the proportion which it contains of that substance, the same power that would be produced by the direct application of a similar quantity of lime. It is however, apparent that some descriptions of marl, though advantageously employed on most soils, do not contain any, or only a very small portion of the carbonate of lime; its efficacy therefore cannot be solely attributable to that cause[*], and it must possess some other property from which its influence upon the land is partly derived. This may consist either in the change which its application produces in the texture of the ground through the mere increase of its bulk, which, by its dense and unctuous quality, also adds to the consistence and value of all light soils; or, by the more perfect combination of the particles of which it is formed, by which its powers are brought into full action, and lime, sand, and clay are each made to bear against each other, and thus aid its mechanical operation on the land. All marl, except those species which are combined with large portions of iron, sulphur, or deleterious mineral substances, also of itself affords nourishment to corn and vegetables; it must, therefore, be considered as a soil, and when laid upon the land, this addition must necessarily yield a more abundant support to succeeding crops.

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* Treatise on Mildew, 2d edit. p. 26. 'The substance called clay, in many other districts, contains a larger proportion of alumen, or clay proper, with a very limited quantity of lime, and is, consequently, not adapted for husbandry purposes; at least, not upon tenacious soils.'

† Papers of the Bath Agricultural Society, vol. x. p. 108.

* Communications to the Board of Agriculture, vol. vi., art. 3.

If this view of the subject be correct, it may be assumed, that all kinds of marl which abound in calcareous matter may be considered applicable to every soil to which lime is beneficial; subject, however, to the effect which may be also produced by the other portions of their substance when applied to land of a peculiar nature. Thus—as we have already more fully stated in the preceding part of our observations—on light, sandy, and gravelly soils, an advantage is gained by the large quantity of clay which the marl appropriate to such land usually contains, by rendering them more stiff and impervious to the rain, and therefore stronger: on wet and heavy lands, on the contrary, as it renders the soil more retentive, unless very great care be bestowed on their drainage, it may occasion permanent injury; but shell and stone-marl occasion it to become loose and friable. Attention should therefore be paid, not only to the nature of the marl, but to that also of the soil to which it is to be applied; and when a choice of marl can be procured, its earthy portion should differ as widely as possible from that of the ground upon which it is intended to be laid.

In fine, marl may be considered as an improver of the soil under so many different circumstances, that it can hardly be recommended in too strong terms; for if it be used with judgment, it adds staple to the soil, improves its quality, and renders the application of putrescent manure more effectual. The use which some farmers make of it, however, deserves the highest censure,—'many of them taking repeated crops of oats in the interval of one summer-fallow for wheat, by way of cleansing the land; after which, barley and oats again, as long as the land will produce anything, until it is at last laid down with weeds and couch-grass. Such is the view taken of their conduct by the surveyor of Lancashire, where it is very extensively employed, and in which opinion he is by no means singular. The rotation which he recommends—with reference, of course, to land that is not too strong—is to take one crop of oats the spring subsequent to marling; plough the stubble immediately, in order to expose the marl again to the influence of the frost; fallow, with manure, for turnips—a crop which, under this management, is never known to fail; then barley, clover, wheat, turnips fed off with sheep, and barley again, with well-dressed hay seeds, and white clover and trefoil for a perennial ley, or at least for some years[*]. Under which management, poor land may, when properly tilled and duly supplied with putrescent manure, be rendered highly exuberant without being in the least degree harassed.

Analysis of Marl.

The value of marl, as a manure, must of course be referable to the nature of the different kinds employed. It is, indeed, evident that, being intended to correct or improve the soil, its constituent parts should be known, and their qualities explained, before any use can be rationally made of it; and, therefore, the more accurately its properties are ascertained, the more confidently may the propriety of its application be determined. Farmers, indeed, cannot be expected to be sufficiently acquainted with chemistry to be able to analyze it, though the most calcareous sorts may be known by means of acids, as applied to lime; or, the common earthy kind, when put into water, will fall to pieces, allowing a considerable portion of sand to fall to the bottom of the vessel: by which simple tests, they might often derive considerable advantage. Its qualities are, however, more generally taken, by mere practical men, more upon trust derived from the experience of their neighbors than from any actual knowledge of its properties; but although, when thus guided, they cannot go far wrong, yet they may be misled by circumstances of slight apparent difference, and, in cases of new pits being opened, no certain estimate of its effect can be formed until a complete analysis has been made. This should, indeed, be done in all such instances; for it costs but a trifle, is easily performed, and without having recourse for the purpose to a regular scientific chemist, the object may be attained by application to any intelligent apothecary, by furnishing him with the following account of the modes of procedure:—

The ingredient of marls, on which their fitness for agricultural purposes depends, is the carbonate of lime. It is owing to the presence of this earth that marls effervesce on the addition of acids, which is one of their distinguishing characters: to ascertain which—

'Let the marl be put into a glass partly filled with water, which will expel a portion of air contained mechanically in the marl, and thus obviate one source of fallacy. When the marl is thoroughly penetrated by the water, add a little muriatic acid, or spirit of salt. If a discharge of air should ensue, the marly nature of the earth will be sufficiently established.'

Then, to find their composition—

'Pour a few ounces of diluted muriatic acid into a Florence flask, place them in a scale, and let them be balanced. Then reduce a few ounces of dried marl into powder, and let this powder be carefully and gradually thrown into the flask, until, after repeated additions, no further effervescence is perceived. Let the remainder of the powdered marl be weighed, by which the quantity projected will be known. Let the balance be then restored. The difference of weight between the quantity projected, and that requisite to restore the balance, will show the weight of the air lost during the effervescence, and will stand thus,—

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[*] Out of twelve specimens of marl submitted to the inspection of Sir Humphry Davy, eleven were found to contain calcareous earth in various proportions; but the result of many other trials of marls, procured from different parts of the country, and found by farmers to produce an ameliorating effect upon the land, yet proves them to be, in many instances, wholly deficient in that substance. See the section on 'Marl,' in Holland's Survey of Cheshire.

[*] Dickson's Lancashire, Stevenson's edit., p. 491.

'If the loss amount to 13 *per cent.* of the quantity of marl projected, or from 13 to 32 *per cent.*, the marl assayed is calcareous marl, or rich calcareous earth.

'Clayey marls, or those in which the argillaceous ingredient prevails, lose only 8 or 10 *per cent.* of their weight by this treatment; and sandy marls about the same proportion. The presence of much argillaceous earth may be judged by drying the marl, after being washed with spirit of salt, when it will harden, and form a brick[*].

From the New York Farmer.

ELECTRICAL SHOCK FROM A SHEET OF PAPER.

Place an iron japanned tea tray on a dry, clean beaker-glass, then take a sheet of foolscap writing-paper, and hold it close to the fire until all its hydrometric moisture is dissipated, but not so as to scorch it; in this state it is one of the finest electrics we have. Hold one end down on a table with the finger and thumb, and give it about a dozen strokes with a large piece of India rubber from the left to the right, beginning at the top. Now take it up by two of the corners and bring it over the tray, and it will fall down on it like a stone; if one finger be now brought under the tray, a sensible shock will be felt. Now lay a needle on the tray with its point projecting outwards, remove the paper, and a star sign of the negative electricity will be seen; return the paper, and the positive brush will appear. In fact it forms a very good extemporaneous electrophorus, which will give a spark an inch long, and strong enough to set fire to some combustible bodies, and to exhibit all the electric phenomena not requiring coated surfaces. If four beaker-glasses are placed on the floor, and a book laid on them, a person may stand on them insulated; if he then holds the tray vertically, the paper will adhere strongly to it, and sparks may be drawn from any part of his body, or he may draw sparks from any other person, as the case may be; or he may set fire to some inflammable bodies by touching them with a piece of ice.

I beg to remain,
Yours, &c.

G. DAKIN.

Oxford, March 20, 1836.

From the Cultivator.

DIFFERENT KINDS AND QUALITIES OF THE MULBERRY.

No little confusion and perplexity prevails as to the distinctive names and synonymes of the different kinds of the mulberry, and as to the relative qualities of each for producing silk. The kind specifically known as *multicaulis*, has been equally well known under the synonyme of *Chinese.* Seed has been recently vended in our market, as Chinese, at the enormous price of $5 the ounce, declared not to be the multicaulis, and believed not to be a species ever grown in China. The red of America has been confounded with the black of Europe. We hear of the Dandolo, Italian, Brussa and Constantinopolitana; and of the rough, dwarf and Pennsylvanian—the first four of which, we suspect, are identical, and the latter perhaps only varieties of the red, as neither Beck nor Eaton make mention of any American species but the red. Yet we have had forwarded to us, by a friend, three impressions of mulberry leaves, said to be indigenous, growing wild in Ulster, which seem not to belong to any of popular species, and two of which, at least, appear to be dissimilar. Upon these, our correspondent successfully fed the silkworm. Two of these leaves are 10½ inches long and 8 broad, the other is 8 inches long and broad; and we are told of indigenous kinds bearing both red and white fruit. If our friends will furnish us seeds of indigenous kinds, other than the red, they will confer on us a favor, and perhaps do a public benefit.

In the mean time, though we cannot promise to clear up the matter, we will endeavor to throw upon it all the light in our power.

We will in the first place, show, from three modern authorities, all the species of the mulberry which have been described. Kenrick, an American authority, names five species, viz:—

Botanic name.	*Common name.*	*Native of*
1. Morus Nigra, - -	Black, -	Asia Minor.
2. Do. Rubra, - - -	Red, - -	N. America.
3. Do. Alba, - - -	White, -	China.
4. Do. Moretti, - -	Dandolo, -	Italy.
5. Do. Multicaulis, -	Many stalked,	China.

Loudon is silent as to No. 4, gives Italy as the native country of the black, and adds:

6. Morus Tartarica, -	Tartarian, -	Tartary.
7. Do. Tinctoria, - -	Fustic wood,	West Indies.

And Sweet adds to the list:

8. Morus Italica, - -	Italian, -	Italy.
9. Do. Constantinopolitana,	Constantinople,	Constantinople.
10. Do. Scabra, - -	Rough, -	N. America.
11. Do. Pennsylvanica, -	Pennsylvanian,	do.
12. Do. Pumula, - -	Dwarf, -	do.
13. Do. Indica, - -	Indian, -	East Indies.
14. Do. Sinensis, - -	Chinese, -	China.
15. Do. Mauritiana, -	Mauritius, -	Mauritius.

The three last named are stove and green-house plants, and of course, too tender for our climate.

1. The black is peculiar to Europe and Asia, and does not, when introduced, stand well our northern winters. It seems from Gen. Tallmadge's letters, published in the Journal of the American Institute, that worms fed on the black mulberry make the strongest thread, and we are left to infer, that Italian sewing silk, which is of the hightest repute in the market, comes from this species of the mulberry. This is given on the authority of an extensive manufacturer of Italian sewing silk.

2. The red mulberry abounds in our woods, in several of the states, but it is a different species from the black of Europe. Good silk has been produced from the leaves of this tree, in Kentucky, Ohio, New York and Pennsylvania, and we have been presented with a beautiful fabric produced from it in the first named state. It is quite hardy.

3. The white is the common kind, well known

4. The Dandolo is a new species or vari

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[*] Henry's Elem. of Exper. Chem., vol. ii. chap. xv. sect. iii. See also Kirwan on Manures, p. 12.

discovered in Italy in 1815, of great promise, and is probably identical with the Italian of Sweet, (No. 8,) and possibly with those from Constantinople, &c. Its qualities for silk are not fully known; but we believe it to be more hardy than even the common white, if, as we suspect, we have a plant of it in our grounds.

5. The multicaulis, we are obliged to persist in saying, is too tender for our climate, north of 42°. We believe all attempts to cultivate it here, will end in disappointment. The white and the black suffice in the great silk countries of Europe. Gen. Tallmadge tells us, after he had traversed Italy and France, and made silk the subject of special observation and inquiry, that "we have more of the Chinese (multicaulis,) growing than France and Italy together;" and that though the silk from the multicaulis was finer and more delicate, it required more skillful and delicate work to wind and work it.

6. and 8. Of these we know very little, except the latter should be the Dandolo; and 7 is employed merely as a dye-wood.

9. We believe to be the same as the Brussa, which is cultivated in Asia Minor, and seeds of which have recently been introduced from Constantinople, by Mr. Rand. Great hopes are entertained that it will be found useful and hardy, though these hopes remain to be confirmed—the seed not having been sown, we believe, till 1834.

The next three named, (10, 11, 12,) which purport to be American species, are not recognized, as we have before observed, by American botanists; and yet we think that on examination, it will be found, that we have more than one indigenous species.

Having alluded to the letters of Gen. Tallmadge, we make from them the following extract, for the benefit of our silk growers:—

"Finizio is an extensive manufacturer of sewing silk; he makes about 3,000 pounds a week, which is mostly sent to the New York market. He is an intelligent man, and I found him willing to answer my inquiries; as also were several other establishments, and which mostly confirmed his statement. The sewing silks of Naples are mostly made from the silk grown in *Calabria*, where the worm is fed principally upon the *black* mulberry, and which makes the strongest and best for sewing silk. Finizio stated that the worm fed on the black mulberry made the strongest thread; *that* on the *white* mulberry, finer and better for fabrics; *that* on the Chinese mulberry still finer and more delicate. When asked if the cocoon from the Chinese mulberry required more skilful and delicate work to wind and work it, he said it did, and immediately produced two skeins, one of which he said was from the black mulberry (from a bush, perhaps, eight or ten feet in circumference,) the other from a bush about four feet. The lesser bush, he said, was less liable to break the thread in winding from the cocoon, and was used in finer silks for fabrics. The black mulberry produced a stronger thread, and would bear the larger reel, and was principally used in that business. The silk here is mostly made in the country by families in detail, and much of it reeled there, and in this condition it is brought to market. For sewing silk it is doubled as often as required, and twisted as much. This process is wholly in a *dark room*. The silk is worked wet, and for this purpose, to preserve a uniformity, the atmosphere is kept damp, the day-light excluded, and the work carried on with small hand lamps. The machine was turned by men harnessed like mules. I have since been out about twenty miles to the silk factory of the king, which is worked by water power, and by which the cocoons are also reeled. I stated to Finizio, as also the king's factory, that the Italian sewing silk was sold in the American markets by its weight, while the American sewing silk was sold by the skein; and that one pound of the Italian would have perhaps 250 skeins, while one of the American silk would have about 350 skeins. The cause of this difference of weight, or why the American sewing silk has a tendency to curl or knot, they could not explain without a sample, but said the weight of sewing silk could be diminished or very considerably augmented in the *dyeing*, and that good dyeing required the silk to be well *boiled* in *soap*, after which it was put into an acid, and was there prepared for the process of the dye, according to the color, as desired. The gloss, or dressing, seems to be produced by beating and twisting on a post, which, with the manual labor put upon its finish, it is supposed, prevents its tendency to knot.

"I asked if the color of the cocoon, yellow or white, gave any difference of value, or indicated a sickly worm, and the answer was that the color was casual, and the value the same; that a selection of white or yellow cocoons from which to get eggs would probably produce a like color; and Mr. Finizio, said he had some customers who had so selected and brought him *cocoons* entirely *white;* and that for white ribbands or fabrics, they commanded a greater price of from three to five per cent, though otherwise of equal value."

While on the subject of the mulberry, we will mention a new mode of propagating or growing it, related to us by a gentleman from Michigan. It is to lay the entire plant, while a seedling, in the furrow, lengthwise, at a proper distance, and to cover them with the plough. The plant sends up a number of shoots, and if left to grow, forms what is technically called a stool. We understood our informant to say, that he had eight acres growing in this way. The advantages which this mode promises, are, first, the plant is rapidly multiplied; second, the leaves are gathered with greater facility, from the dwarfish habits of the plant; and third, and we deem this a very important advantage, if the wood is killed by the winter, and this is sometimes the case, even in Michigan, and often here, the roots are preserved, the dead wood may be readily cut off with a bush hook, and new and vigorous shoots, spring up from the base. We believe this mode of growing might be profitably adopted in regard to the multicaulis.

From the Transactions of the Massachusetts Agricultural Society.

BEET ROOT SUGAR.

Roxbury, June 15, 1836.

The Hon. Thomas L. Winthrop,

Sir—Mr. Isnard put into my hands a few days since a memoir "On Indigenous Sugar, and the

Actual Situation of that industry in France, &c." It was published in the early part of this year in Paris, by M. de Dombasle. That gentleman was for many years concerned in a large establishment, for the manufacture of beet sugar, but he is now the Superintendent of the National Experimental Farm, which is a highly valuable appendage to the Royal Agricultural Society. He has long been well known, as one of the ablest writers, and most intelligent experimentalists, on rural affairs, of modern times; being equally as conspicuous for his practical illustrations, as for his great scientific attainments, in whatever relates to the advancement of the useful arts, and the tillage of his country.

I have made several extracts from his very interesting and instructive work, with the view of presenting, in a succinct manner, the progress which has been made, and is now making in Europe, in this important branch of industry.

It appears, that the manufacture of sugar, from the beet, was first attempted in Silesia, by Mr. Achard, in the early part of the present century, but was soon abandoned. In 1810 successful experiments were made in France, by MM. Andre and Isnard, which having been made known to the Emperor Napoleon, under the auspices of the radiant and mighty genius of Chaptal, he issued an imperial decree, for encouraging the manufacture, on a large scale, and establishments were commenced at the village of Point-a-Mousson in Lorraine, in 1811 and 1812. It is not a little remarkable that the first was erected under the superintendence of Mr. Isnard, and is still in full and successful operation, after a suspension of a year or two.

M. de Dombasle observes, "This industry, although so powerfully favored by the imperial government, seemed to expire with it; and it was not until 1820, that but very few people believed the manufacture of sugar from the beet, was anything more than a ridiculous attempt to achieve what was impracticable, and had been induced by the long and rigorous continental blockade, which had enhanced the price of sugar to 90 cts. per pound. Still the sparks of this industry were preserved in France; it has maintained its position amid moderate duties, which were imposed on foreign sugar, for the mere purpose of revenue. So that, in truth, it may be said, that it has prospered, not only without the aid of the government, but in spite of it; for nothing is more remarkable than the disdainful manner in which it was treated, until 1830, by the national administration. It appeared that the Bourbons could not forget the stigma of its imperial origin. At last the government has been compelled to notice its existence: for it has become so important, from the great results which have been produced, that it can no longer be disregarded. From the ten to twenty millions of pounds of sugar, which were brought into market, some five or six years since, the quantity which will be made this year, will amount to 60,000,000 of pounds."

"To judge properly of the importance of an industry, which has for its end the creation of a product, which has hitherto been furnished by our colonies—to appreciate the degree of encouragement, which it merits, on the part of those public men, whose province it is, to watch over the prosperity of their country, and to hasten the increase of national wealth, it is necessary to glance at the situation, in which France is now placed, with respect to her colonies. The present generation are the observers of a most grave and important spectacle. It is that presented by the fall of the gigantic colonial edifice, which the Europeans had reared in the new world. The English colonies of North America commenced the march of this grand trans-atlantic revolution; and France, herself, by aiding them in their separation from the mother country, laid the axe at the base of the colonial structure; for it was easy to foresee, that as soon as a single one of the American nations, broke the fragile bonds, which placed a whole country under the dependence of a government situated in another hemisphere, all the moral power of the colonial system was annihilated; and the *independence* of all the other colonies would soon be the inevitable consequence."

"The enfranchisement of all the people on the American continent has now been consummated. Can it be seriously believed, that a few Islands, situated in the vicinity of that continent, will long remain dependent upon the people of Europe. In the slave colonies, a very evident cause has tended to retain the people as dependent upon the parent country. There, no revolution was possible in favor of the whites, and if any occurred, it must be like that of St. Domingo. The colonists, therefore, dare not attempt any enfranchisement, in favor of themselves, in the West Indies, for their only reliance against a servile revolt and war, was on the parent country. But now the parent country has commenced the abolition of slavery, in those countries, and it is very certain, that the emancipation of the blacks, strikes a fatal blow to the cultivation of sugar, and will ultimately extinguish it. This is a truth, which no one can doubt; and it is highly probable, that if no accidental cause strips us of our West India colonies, we shall soon be obliged to forego their products of sugar; for it cannot be reasonably believed that France can long maintain slavery in her colonies, when the blacks are emancipated in the neighboring English Islands.

"It is under these circumstances, that Providence has offered us the means of replacing the richest product of our colonies, by a vegetable of our own country, and which at the same time introduces into our agriculture a plant, which favors its progress in an eminent degree, as it forms a most productive element for fattening cattle, and enriching the land."

M. de Dombasle, is of opinion, that in the British government, there was a profound priciple of political economy concealed under the apparent spirit of philanthrophy which sanctioned the abolition of slavery in the West Indies. That it had in view, the ultimate monopoly of the sugar trade of the world, as her East India colonies could supply the entire demand of Europe at least; and her policy has ever been to favor her vast oriental possessions, at the expense, and ultimate destruction, of the West India planters.

Mr. Isnard has submitted to my examination, some preliminary observations and calculations, on the establishment of a beet root sugar manufactory in this state. He has given the details of the expense and estimated net income, on a given capital, by which it appears that from 25 to 75 per cent. may be realized. I hope, some of our enterprising capitalists will be induced, to undertake the experiment; for that it must ultimately become one of our great branches of industry, scarcely admits of a doubt.

I do not know any subject so worthy of the consideration of the Massachusetts Agricultural Society, as this new culture. It will render our climate independent of the tropics, and introduce a great valuable staple for our farmers, which has been much required, to elevate them to the level of other more naturally favored portions of the union. We have no distinctive *crop*, to which our land owners can direct their attention as a constant and certain source of profit. Even Indian corn is not always to be relied upon, and our soil is not generally congenial to wheat. We are too far north to enter into the lucrative culture of tobacco and cotton, and are compelled to confine our labors to the rearing of an infinite variety of small articles, or to grazing. Butter, cheese, pork and beef are our chief products, which are raised at a vast expense, for our winters require such immense fields to furnish hay for the stock during that long protracted and rigorous season, that the farmer is precluded from acquiring a fortune, which he is so deservedly merits, from his arduous and patient industry, and for which all the other classes of society are emulously striving, and which they can, more certainly attain. By labor without end, it is true, the farmer can live comfortably, but seldom is it, that he reaches a more happy condition. This is to be lamented. In other states the owners of land are in the high road to affluence, and why should not a mighty effort be made to ameliorate the condition of the virtuous, hardy and intelligent husbandmen of New England.

The quantity of flour and cereal grains—as wheat, corn, rye, barley, and oats, annually imported from the middle, southern and western states is enormous, and is a sufficient commentary on our soil and climate, for the culture even of bread stuff; and we export, of agricultural products, but little. This discouraging aspect of our agriculture, has induced hundreds of thousands of our active and vigorous young men, to emigrate to other sections of the United States, where the soil and climate are less adverse to the hopes of the farmer. But if the culture of the sugar beet is successfully introduced, the ultimate benefits which will result, may be anticipated, from what has been accomplished in France, within the brief period of fifteen years. I confidently believe, that the culture of silk and the sugar beet will effect such a salutary chance, in the condition of the farmers, that they will present as much prosperity, independence of circumstances, and affluence, as the cultivators of the earth in any portion of the globe.

Germany, Prussia, and Russia, have recently entered, with zeal, into this favored branch of rural economy; and even England, where there has, hitherto, been such an indifference to the subject, if not amounting to contempt, I perceive, by the very last arrival from London, has at last awakened from her stupor, and a company was about being organized, under the name of the United Kingdom Beet Root Sugar Association, with a capital of 1,000,000 of dollars.

Mr. Isnard having first aided in introducing the manufacture of sugar from the beet, in France, and having kept himself constantly informed of the various improvements which have been made since, may well be confided in, as an able pioneer, for this industry in the United States.

In Philadelphia, efforts are being made, by a company, to commence the culture of the beet and to manufacture sugar in Pennsylvania. An agent has been sent to France to collect information; and from the measures which are in train there is very prospect of a favorable result.

From your long and meritorious services, as an officer of the Mass. Agricultural Society, and your known patriotic disposition to advance the best interest of your country, by all the possible means within your power, I am fully persuaded, that this very interesting subject will receive from you and your highly respectable and public spirited associates, all that consideration, countenance and encouragement, which it appears so pre-eminently to merit.

With sentiments of the highest respect,
Your most ob't serv't,
H. A. S. DEARBORN.

From the Mechanics' Magazine.

STEAM, *versus* WATER.

Few persons even in this age of inquiry and improvement seem to be aware of the vast superiority of steam over every other form of motive power. Many are still, by this assertion, reminded of the anecdote of the famous Brindley. In giving evidence before a Committee of the House of Commons on the subject of canals, he spoke of their superiority as a mode of communication in such decided terms, that a member asked for what he thought rivers were intended? he unhesitatingly replied, "*to feed canals.*" Now, though we say that the manufacturer will one day "feed his boiler from the falls," we think that the assertion is not a bold one, and that it does admit of proof.

Some time ago, our attention was directed to a comparison of the expense of the two forms of power in the village of Lowell, possessed of the best water power in the union. The expense of steam to water was said to be as 100 to 125.

We have since often had this subject in mind in reference to the more improved use of steam, and particularly to the economy of the rotary engine of Avery.

Pursuing the comparison, we have collected some of the more prominent disadvantages of the usual hydraulic system, and the corresponding advantage of steam power.

The first item of cost is that of the water-right, over and above the value of the ground as increased by any other advantages of locality. This expense is in no case trifling, and sometimes is positively enormous. There is, of course, no corresponding item of expenditure in the use of steam, an engine working as well on the top of a hill as in the bottom of a valley.

2d. The outlay upon wheels, dams, and other hydraulic works. This is often much greater than would be necessary for the average pressure, provided it were constant—that is, we are to erect works to support much more water than we have supplied through three quarters of the year. Freshets, &c. are to be provided against, at an increased cost. It is well known that in some locations the provision for such contingencies is no small portion of the whole capital employed.

It is this expense, other things being equal, that is to be compared with the cost of an engine, and the comparison is favorable to the latter.

3d. After every precaution, damages from floods are of constant occurrence, and their repair is exceedingly costly.

4th. The delay caused by freshets, &c., producing a stoppage from the too great supply of power.

5th. The delay in seasons of drought, when the supply is insufficient.

These last are most vexatious occurrences, preventing work often times when most is to be done, and the uncertainty arising from the possibility of such delays and accidents, is a constant care to the manager of such an establishment, whereas to the consumer of steam, the perfect certainty of the amount and regularity of the supply of power is a great auxiliary in conducting business.

For a steam engine, the only use of water is a sufficiency for the boiler; and in these days of economy of heat and steam, a very small quantity of fuel is used, and but little water. We have seen a rotary engine, estimated at 15 horse power, evaporating but 40 gallons per hour.

6th. Delay in winter, and in our uncertain climate this may sometimes be considerable, and in an establishment of great extent perhaps fatal.

To balance all these expenses, pecular to the use of hydraulic power, there is, as far as we can recollect, but one peculiar to that of steam, namely, *fuel*. Now in saw mills this expense is nothing, and in all instances much less than formerly.

Our persevering countryman, Dr. Nott. has already succeeded in greatly reducing this item of cost—and he does not yet appear to be satisfied.

As regards fuel, Avery's engine has immense advantages over others, inasmuch as the quantity of water used is less than in any other case. The elasticity of the steam operates more advantageously than in any other construction, the small quantity of water used being a proof of this.

In the engine above referred to, the cost for coal was rather less than $1 for ten hours.

It is almost needless to observe that, in many large establishments, manufacturies, &c., the application of a portion of the steam to heating, &c., nearly, if not quite, compensates the cost of fuel. The certainty and uniformity of this method of drying goods, have fully established its superiority. Indeed, in the art of dyeing, certain colors owe their brilliancy to the rapid and high heat of steam, and they could be produced in no other way. While speaking of this use of steam, we must notice an engine erected in the Astor Hotel. This is a small engine of 5 horse power; its use is to pump water from the different cisterns to all parts of the house—supply the baths with hot and cold water—clean knives—brush shoes—roast and grind coffee; and the steam cooks the various dishes in the kitchen, and also dries the clothes, which by this method of proceeding, are ready for use with unprecedented despatch. To these and numberless other uses is this engine turned, saving an immense number of servants, a great quantity of fuel, and a vast deal of time.

(The exhaust steam pipe of this engine is over 300 feet long.)

One of the greatest advantages of steam power, in many cases, is, that it admits of change of locality, without injury to the machinery, and often with benefit to the employer.

In this respect again Avery's engine stands pre-eminent. The machinery is beautifully compact, and consequently portable. An engine of 15 horse power is hardly a load for a horse, the whole weighing less than 600 pounds.

Let us suppose, that a man purchases a piece of timber land, of prime quality, but unfortunately (as is thought) away from any water course.

Let him procure an Avery's engine; and this, connected with his saw mill, can be placed upon wheels and moved, by the engine itself, if he pleases, to any part of his land. (Mills capable of such an arrangement, and very compact, are now easily to be procured.)

Let him locate his mill near a spring, and commence operations. The waste and rubbish, that in most cases is a drug, is entirely consumed by the engine; the ground is cleared, and nothing is to be removed but the perfectly formed timber.

Among other useful applications of such an engine, in the forest itself, no one can be equal in beauty of operation to the valuable *stave machine* of Philip Cornell, N. Y. This machine promises to be of great service. With such an arrangement as that of the saw mill above mentioned, nearly if not quite double the usual number of staves can be cut from the timber before transportation, and these are already dressed, and ready for use, either for liquids or solids.

These are only a few of the very many useful applications of this sort of travelling machines. Others will suggest themselves to our readers.

It must be very evident, that whatever brings into use property of little or no value, enabling the produce of such land to compete successfully with that of much better, must add to the wealth of the landholder, or timber merchant, a sum equal to the cost of the best land.

Thus a greater uniformity of value would result, and of consequence a more equal competency to those on or away from great water courses and canals.

Our object is to draw attention to this question, and we should be much gratified if any of our friends would furnish us with such information on the subject as they may have at their command.

This information from various quarters when collected, might furnish results equally useful and interesting—and we shall feel most happy in becoming the medium of their communication to the public.

From the Silk Culturist.

PRICE OF CHINESE MULBERRY.

The great advance in the price of the Chinese mulberry during the past year, furnishes us with satisfactory evidence of the estimation in which it is held, and of the eagerness with which the people of this country are embarking in the culture of silk. Last spring we purchased a few, which had endured the severity of the preceding winter, at ten cents a piece, and thought we paid the full value of them. The same sized trees are now selling at thirty cents by the thousand, at the nurseries. We are also credibly informed that the demand in France is so great that they have risen near fifty per cent. The value of this tree is not as yet duly appreciated, but should it become thoroughly acclimated, of which there is now but little doubt, it will soon become the pride of America as it has long been of Asia. The high price of the tree ought not to discourage farmers from procuring a few for the purpose of propagation. It will be many years before the whole country can be supplied from the seed, and whoever propagates it by cuttings, layers, or inoculation, will be abundantly recompensed for his expenditure and labor.

From the Rail Road Journal.

MARBLE CEMENT.

An important improvement, which has been for several years in progress, is about being introduced to the more general notice of the public, and we believe into extensive use for building purposes. It is a composition, or cement, of which the principal ingredient is marble or limestone, which, when applied to the inner or outer walls of buildings, presents the appearance of polished marble, of the various hues and qualities which distinguish the beautiful material imitated. What would be thought of a magician who possessed power of changing the sombre brick and stone walls of the buildings of a city, in one week, into substances resembling the most beautiful Grecian, Italian, Egyptian or Verd Antique Marble, or porphyry, like the rock of Gibraltar? Yet all this may be done by this invention of an humble citizen of Orange county, in this state. This cement has been sufficiently tested by experiments on buildings, to satisfy practical men of its decided superiority over any other cement, stucco, or other hard finish for walls, hitherto known. In our next number we expect to be able to furnish the public with some interesting particulars, on this subject; and in the mean time we can state, that a company has been formed, in this city, to carry on the operations connected with the manufacture of this new cement, and its application to buildings. Those who are curious in these matters, may obtain further information in relation to it, by applying at this office, or at the office of Edwin Williams, over Leavitt, Lord & Co., Broadway.

From the New York Farmer.

NEW MODE OF OVERCOMING STEEP INCLINED PLANES ON RAILWAYS.

I witnessed at the capitol with great pleasure on Monday last, Mr. Smith Cram's (of the city of New York) invention for overcoming an elevation in rail road transportation of 440 feet to the mile. It was performed with expedition by a single stroke perpendicular engine, which, in point of power, suffers much in comparison with a double stroke locomotive engine.

His plan as exhibited, puts at rest all doubt as to the practicability of ascending and descending hills from 450 to 600 feet to the mile, with certainty and security. As to the certainty of overcoming elevation and inclination, the cog-wheels and ratchets as arranged satisfactorily show. As to the security, it is to be found in the introduction of his hydrostatic cylinder attached to the car which is designed to check the train of cars in ascending, should any accident befal the engine, and to regulate their velocity in descending, or check them altogether. The accuracy of the principle in both cases is perfectly clear, and promises to be of incalculable value in the present age of improvement; and I doubt not it will be generally adopted upon the score of economy as to time and money; but above all, the preservation of human life, which his plan so effectually guarantees, in comparison with the present mode of overcoming a trifling elevation by stationary power, committing our lives to the hazard of a single rope.

FULTON.

From the Southern Literary Messenger.

ADVANTAGES OF MANUAL LABOR SCHOOLS.

Extract from an Address delivered by the Rev. B. F. Stanton before the "Literary Institute" of Hampden Sydney College.

* * * * * The following important positions, however, in regard to the subject, may now be considered as established. Constant habits of exercise are indispensable to a healthful state of the body. A healthful state of body is essential to a vigorous and active state of mind. The habit of exercise should commence with the ability to take it, and should be continued with that ability through life. Of the different kinds of exercise, as a general rule, agricultural, being the most natural, and to which the human constitution is best adapted, is the most unobjectionable; *mechanical* is the next; and walking and riding are the employments which follow in the rear. The exercise most profitable, for the most part, will be that which is most useful. The neglect of exercise, with sedentary men, has occasioned fearful havoc of health and life; and the wilful neglect of it, with those who have had an opportunity to be enlightened with respect to its necessity and value, is a species of suicide, and, therefore, *an immorality*. The connection of *manual labor establishments with literary institutions*, has been found to be greatly conducive to health and morals, as also to proficiency in the various departments of human learning; and as far as experience has gone, the promise which they give of success is all that their most sanguine projectors had anticipated.

On the subject of *manual labor schools*, a deep interest has within a few years been excited in various parts of the Union. Like all other enterprises which aim at the accomplishment of extensive good, it has met with opposition and discouragements; but originating in the principles of true wisdom, and supported by arguments and facts which none can gainsay or resist, its ultimate triumph may safely be predicted, and confidently anticipated.

Whether the system of physical education shall receive the countenance, or is suited to the peculiar circumstances of the southern country, may with some be made a question; but we are ready to hazard the assertion, that whatever obstacles of a peculiar nature may here lie in the way of reducing it to practice, if properly considered, they must be seen to be in truth the most powerful inducements that can be urged for its adoption.

The country in which physical education cannot prevail, in the onward march of improvements for which the present age is distinguished, must necessarily be destined to be outstripped in the pursuit of those objects which constitute the felicity and the glory of a people. That this country is to fall behind, and to be contented to remain there, is to suppose an event too disreputable for tolerance, and too much opposed to a laudable spirit of emulation to be cheerfully acquiesced in. The south needs men of vigorous constitutions for professional avocations and other purposes, as well as the rest of the world, and if she has them, must obtain them by the same process. Trained on a different plan, her sons, in comparison with others, will be effeminate and inefficient. Many of them, as has happened with others in past times, would become the prey of incurable disease, or fall the victims of an untimely grave. According to the most accurate investigations that have been made, at least *one-fourth* of the individuals who, for several years past, have been educated in our American colleges, have been completely prostrated in their course, or have survived only to drag out an existence rendered burdensome to themselves and unprofitable to others. The voice of warning on this topic, while mournful and alarming, is as "*the voice of many waters.*"

* * * * *

In opposition to the system of education which we would defend, a voice of objection has been raised, to which it may not be improper to pay a passing regard.

It has been preferred as an objection to manual labor schools, which we shall assume, are, on the whole, the most unexceptionable expedient that has been proposed for connecting exercise with a course of literary training,* that *youth who have been unaccustomed to manual labor, and who have been permitted to indulge in idleness and sportive amusements for the purpose of recreation, will feel an insuperable aversion to the toils and restraints which such a revolution in their habits, as the one contemplated, will impose on them.*

The process of *taming*, though quite essential to the unruly, to "flesh and blood" is never "joyous, but rather grievous." The objection started is something like that which the celebrated Rush, in some of his original effusions, has observed is met with in the case of certain morbid patients, whose *weak stomachs refuse milk as a diet.* The food itself, in the judgment of the acute physician, is of the most simple, inoffensive, and invigorating character; and *the fact that it is rejected is the proof that it is needed.* The intemperate can ill brook the privation of *alcohol;* the epicure and debauchee will not relinquish with good will the gratification of inordinate appetites; nor will the *slothful*, who *turns himself in his bed as the door on the hinges*, give up with cheerfulness *the luxury of laziness.* But the true and proper question for determination is, would it not be doing to loungers and profligates themselves, as well as to others, a kindness, to put them upon a course of *regimen*, (provided it can be done without too great an exertion of violence,) which should bring them back to nature, and constrain them to a just and proper observance of the salutary laws of industry, sobriety, and temperance? With such an authority we think that the parents and guardians of youth every where should be invested; and those who should manifest a spirit of insubordination against its exercise, if that spirit could not be quelled by a temperate yet firm resistance, would exhibit the proof of a temper that ought to be regarded in a young man *as a positive disqualification for receiving an education.*

In our apprehension, it is by no means among the most trivial considerations that recommend the manual labor feature in a system of education, that it furnishes an admirable *test* by which to try the spirit of a pupil, as well as a choice expedient to invigorate his health, and inure him to habits of diligence and sobriety. A young man whose aversion to a manual labor school is so strong that it cannot be overcome, when the subject has been fairly presented to his mind, it may safely be taken for granted, is not worth educating. The community would lose nothing by the operation of a system which should exclude him from the ranks of its *literati.* Especially would the test in question operate favorably in the education of the *beneficiaries* of the church, whom she is at present somewhat extensively engaged in patronizing, and preparing for her future ministry. Great as we conceive it, and great as the history of past ages has proved it to be, is the hazard which the church runs of rearing an impure priesthood, by proposing the *gratuitous education* of all the professedly "indigent and pious" who will apply for her bounty. The tempation to insincerity which is thus held out is too powerful to be resisted by depraved human nature. The church for safety in this respect must raise munitions and throw up her ramparts, to guard against the admission of unhallowed intruders. And what better defence, we would ask, could the ingenuity of man have devised for the prevention of the evils adverted to, than that *the entire amount of contributions which are made for the education of candidates for the ministry, should flow to them exclusively through the manual labor channel?* An inspired Apostle has said, that *if any man will not work, neither shall he eat:* and in perfect accordance, as we think, with the spirit of this declaration, we would unhesitatingly affirm, that if any man, who has the ministry in view, when the opportunity is fully presented, will not enter a manual labor school, *and labor, working with his own hands*, for at least a part of his support, *neither should he eat the bread of the church*, nor be fostered by her charities to minister at her altars.

To say that students for their recreation need something more amusing and sportive than the useful and sober exercises of agricultural and mechanical employment, is to say that the propensity of young men to levity and frivolity is so powerful that it cannot be, and ought not to be, controlled; that to aim to instil into them the habits and sentiments of gravity and sobriety, is an unnatural and impracticable undertaking; and that it is more advisable to treat them as *merry Andrews*, than as possessing the dignity of rational, immortal and accountable creatures.

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*Gymnastic exercises are both dangerous and frivolous,

Let a system of education make provision for nothing but what is elevated and useful, and still space enough will be left for all the frivolity and sporting which any can deem to be absolutely essential. These things will take care of themselves, and will inevitably come in, on any plan that may be adopted, to secure all the advantages which they are capable of affording.

Another objection which has been preferred to manual labor schools is, *that they contribute but little or nothing to the support of the student.*

The truth on this subject, as could be satisfactorily shown is, that, as might naturally be expected, manual labor schools, being a novel experiment in this country, have had to struggle, as do all similar enterprises of benevolence at the outset, with formidable obstacles; and in some instances, through injudiciousness in their location, or mismanagement in their arrangements, have either been abandoned, or have failed to fulfil the expectations of their projectors. Mercantile and other adventurers often fail in their plans. At the same time it is undeniable, that some institutions of this sort have succeeded beyond all previous calculations, and the students that composed them have not only enjoyed better health than others, and made more rapid advances in knowledge, but a portion of them have, by the avails of their labors, defrayed *the whole* of their expenses; a few have done *more;* and a majority have diminished them about *one-half.* Manual labor establishments, therefore, will do *something* (we ought not to expect them to do *every thing,*) towards *cheapening* education, even in the infancy of their existence; and the thought can hardly fail to be cheering to American republicans and patriots, that in the full tide of successful operation which we believe will attend their maturer age, "full many a flower" which but for them would be "born to bloom and blush unseen," will shed its "sweetness on" Columbia's "air."

But admit for a moment that manual labor schools are an utter failure as regards *the pecuniary advantages which they afford.* Admit, if you please, that the manual labor feature is an expensive part of education, and that to comply with it, an education will cost more than on any other plan. The argument for their utility remains alike unanswered and unshaken. Is not the education thus obtained a more perfect one? Is it not immensely more valuable? Are health, morals, useful habits, vigorous intellects, and life, worth nothing? Is money expended for the improvement and preservation of these thrown away?

If manual labor schools increased the expenses of education *fourfold,* they would still deserve the warm patronage of the public, and all who have the ability should send their sons to them to be educated, in preference to any other institutions, even should they have as many of them as the patriarch, or be endowed with the riches of Crœsus.

It is an ill-judged economy which saves money at the sacrifice of life, health, and morals. Let this subject be *understood* by an intelligent and Christian community, and manual labor schools will not be left to languish and die without endowments, while on other institutions of less substantial claims, they are lavished with a princely munificence.

In this place, it may not be amiss to attend for a short time, to the testimony of some of the pupils and superintendents of manual labor schools, who have detailed the results of their observation and experience, and which is strong and decided in their favor.

In one instance the pupils say, that "believing the results of experiment weightier than theory, we beg leave respectfully to express those convictions respecting the plan of our institution, which have been created solely by our own experience in its details. 1. We are convinced that the general plan is practicable. 2. That the amount of labor required (three hours per day) does not exceed the actual demands of the human system. 3. That this amount of labor does not retard the progress of the student, but by preserving and augmenting his physical energies, does eventually facilitate it. 4. That the legitimate effect of such a system upon body and mind, is calculated to make men hardy, enterprising and independent; and to wake up within them a spirit perseveringly to do, and endure, and dare. 5. Though the experiment at every step of its progress has been seriously embarrassed with difficulties, neither few in number nor inconsiderable in magnitude, as those know full well who have experienced them, yet it has held on its way till the entire practicability of the plan stands embodied in actual demonstration. In conclusion, (they add,) we deem it a privilege, while tendering this testimony of our experience, to enter upon the record our unwavering conviction, that the principle which has been settled by this experiment involves in its practical developments an immense amount of good to our world; it is demanded by the exigences of this age of action, when ardor is breathing for higher attempt, and energy wakes to mightier accomplishment."

On a subsequent occasion another set of pupils belonging to the same institution, express their convictions in a similar tone of approbation.

"The influence of the system," they say, "on health, is decidedly beneficial, as all of us can testify who have pursued it for any length of time. We can pursue our studies not only without injury, but with essential advantage. Not only is our bodily power increased instead of being diminished on this plan, but the powers of the mind are augmented, while moral sensibility is not blunted by hours of idleness and dissipation. We suffer no loss of time, as no more is spent in labor than is usually spent by students in recreation; and we are taught to improve every hour. Our opinion is, that intellectual progress is accelerated rather than retarded by this system. In its success, we are convinced, is deeply involved the prosperity of education, and the great work of evangelizing the world."

The students of Cumberland Colledge in the State of Kentucky, say, we beg leave to state the results of our own experience. Having been for a considerable time, members of a manual labor institution, we have had an exhibition of its principles and efficacy continually before us; and we are convinced that labor, for two hours or more each day, is essential to the health of all close students, and equally necessary for the development of the mind."

The young men in the theological institution at Hamilton, in the State of New York, say, "we feel the fullest conviction that every student who neglects systematic exercise, is effecting the ruin of his physical and moral powers. Nor is the influence of this unpardonable neglect less perceptible or deleterious, as it regards his moral feelings. Without it, however pure his motives, or ardent his desire to do good, we have but faint hopes of his success. Such habits as he would inevitably form, we believe, would ruin all the nobler energies of his nature. We think three hours appropriate exercise each day will not eventually retard progress in study. We must say, from five or six years experience in the institution, we have not learned that any close student has ever completed an entire course of study without serious detriment to health. We hope, however, our present system of exercise will soon enable us to exhibit a different statement. In the preservation and improvement of health, we have found an unspeakable benefit arising from systematic exercise. Without it, we deem it impossible for the close student to preserve his health."

The superintendents of a kindred institution, in a document which they have laid before the public, declare, that they "have great satisfaction in being able to state that a strong conviction pervades the minds of the *young men* generally, as well as their own, that laborious exercise for three hours per day does not occupy more time than is necessary for the highest corporeal and mental energy; that so far from retarding literary progress, it greatly accelerates it; that instead of finding labor to encroach upon their regular hours of study, they find themselves able, with a vigorous mind, to devote from eight to ten hours per day to intellectual pursuits; that under the influence of this system, mental lassitude is seldom if ever known; that good health and a good constitution are rarely if ever injured; that constitutions, rendered delicate, and prostrated by hard study without exercise, have been built up and established; that this system, with temperance, is a sovereign antidote against dyspepsia and hypochondria, with all their innumerable and indescribable woes, that it annihilates the dread of future toil, self-denial, and dependence; secures to them the practical knowledge and benefits of agricultural and mechanical employments; gives them familiar access to and important influence over that great class of business men, of which the world is principally composed; equalizes and extends the advantages of education; and lays deep and broad the foundations of republicanism; promotes the advancement of consistent piety, by connecting *diligence in business* with *fervency of spirit*, and will bless the church with such increasing numbers of ministers, of such spirit and physical energy, as will fit them to *endure hardness as good soldiers of Jesus Christ*.

We are every day more and more impressed with the importance and practicability of the manual labor system, as the only one by which the increasing hundreds and thousands of the pious and talented sons of the church can be raised up with the enterprise, and activity, and power of endurance, which are indispensable for the conversion of the world to God.

To these statements the individual who has collected them, adds his own testimony in the following language: "I have been for three years and a half a member of a manual labor school. The whole number of my fellow students during that period was about two hundred. I was personally acquainted with every individual, and merely "speak what I know," and "testify what I have seen," when I state that every *student* who acquired a reputation for sound scholarship during this time, was a *fast friend* of the manual labor system. The most intelligent, without a single exception, were not only thoroughly convinced of the importance of the system, but *they loved it with all their hearts*. They counted it a privilege and a delight to give their testimony in its favor, and they *did it* in good earnest. Their approval of the system rose into an intelligent and abiding passion; and it is no marvel that it was so; for they had within them a permanent, living consciousness of its benefits and blessings. They felt it in their *bodies*, knitting their muscles into firmness, compacting their limbs, consolidating their frame work, and thrilling with fresh life the very marrow of their bones. They felt it in in their *minds*, giving tenacity to memory, stability to judgment, acuteness to discrimination, multiform analogy to the suggestive faculty, and daylight to perception. They felt it in their *hearts*, renovating every susceptibility, and swelling the tide of emotion. It is true, with a few, a very few of the students, the system was unpopular, and so were languages and mathematics, philosophy and rhetoric, and every thing else in the daily routine, *save the bed and the dinner table*. Such students were snails in the field, drones in the workshop, dumb in debate, pigmies in the recitation room, and cyphers at the black board.

"In every manual labor school which I visited in my tour," he continues, "it was the invariable testimony of trustees and teachers, that the talent, the scholarship, the manliness, the high promise of all such institutions, were found among the pupils who gave the manual labor sytem their hearty approval; whereas if there were among the students brainless coxcombs, sighing sentimentalists, languishing effeminates, and other nameless things of equivocal gender; to prostitute *their* delicate persons to the vile outrage of manual labor, was indeed a *sore affliction!*"

We shall close these selections by adding to them the testimony of an individual* of distinguished literary attainments, whose advantages for obtaining correct information on this topic, as well as many others, have been of the most favorable kind.

"The God of nature," he observes, "has designed the body for action; and all efforts to counteract this design, end of course in disappointment, sooner or later. The same God has designed that men should *cultivate their minds;* and I never can believe that this is deleterious in itself; it is so only when we neglect what he has bidden us to observe, i. e. daily discipline and effort to preserve health.

"Students want vacations, journeys, remission from employment, &c. &c. and this at a great expense of time and money. Why? Because they will not be faithful, *every day*, to watch over their health, and to use all the requisite means for its preservation. Why should the farmer, the machanic, the merchant, the physician, the lawyer, support a never ceasing round of employment, and the student not? Is there any curse laid by heaven upon study? No; it is inaction—laziness—that makes all the mischief, and occasions all the expense. This is my full persuasion from thirty years experience, and somewhat extensive observation."

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* Professor Stuart.

To these selections others of similar interest and importance might be added from the *Report* from which they have been derived, particularly the numerous and harmonious opinions of literary men, *on the necessity and utility of regular systematic exercise to the student;* but our time forbids the indulgence, and the maxim of *Festina ad finem* admonishes us to cut short this address.

From the view that has been taken, we perceive then, with a clearness which cannot be mistaken, that the manual labor system of education is applauded by "a cloud of witnesses," and commended to our patronage and attention by arguments and facts innumerable, palpable, and unanswerable. Will the inquiry be misplaced, when we ask, Shall it *here*, (on this consecrated ground, this literary *high place*, which is destined to send forth a mighty stream of influence for good or ill, to an extent which no arithmetic can calculate,) shall it *here* receive the countenance and patronage which it so richly deserves? Manual labor schools are already in successful operation in this southern country, and the prosperity that has attended them has been such as to silence the cavils of opposers, and remove the apprehensions of the distrustful. With all enlightened and candid persons there can be but *one mind* respecting their practicability and their *peculiar* importance in this southern region. It is the very section perhaps, of all others, within the limits of our republic, that is best adapted to their growth, both on account of its soil and climate, and in which, from its peculiar situation, their influence is most imperiously demanded.

Again, then, I ask, will "the ancient and honorable Dominion" consent to be outstripped by her neighbors in an enterprsie of so much grandeur and promise? Will parents, instructors, and pupils, repose in inglorious ease, and cry *a little more sleep, a little more folding of the hands to sleep*, while others in the race of competition press forward and bear off the prize? Will the young men of Hampden Sidney and Union Seminary sit still; or will they "awake, arise, and put on their strength?" Interests that are dear as honor and life; are suspended on the *practical* reply which this inquiry receives.

It is stated, as is probable on good authority, that in years that have gone by, "some of the Virginian philanthropists offered to educate some of the Indians, and that they received from the shrewd savages the following reply." (He that hath ears to hear, let him hear what the *savages* have said to the *civilized!*)

"Brothers of the white skin! You must know that all people do not have the same ideas upon the same subjects; and you must not take it ill that our manner of thinking in regard to the kind of education which you offer us does not agree with yours. We have had in this particular some experience. Several of our young men were some time since educated at the northern Colleges, and learned there all the sciences. But when they returned to us, we found they were spoiled. They were *miserable runners.* They did not know how to live in the woods. They could not bear hunger and cold. They could not build a cabin, nor kill a deer, nor conquer an enemy. They had even forgotten our language; so that not being able to serve us as warriors, or hunters, or counsellors, they were absolutely good for nothing."

The calamities which are here set forth in such graphic terms have by no means been confined to the fathers and the sons of the forest. The *white* young men of Virginia, in great numbers, have since been educated in like manner "at Northern Colleges," or nearer home: and when restored to their parents and guardians have been found, for the most part, like the sons of the *red men*, to be "*absolutely good for nothing.*" They have proved to be "miserable runners." Not one in twenty of them has risen to eminence in professional life. They could "bear neither hunger nor cold." They were practically ignorant of mechanical and agricultural employments, and strongly averse to them; too high minded and indolent to labor, and too weak and effeminate to "serve as warriors, and hunters and counsellors." Will Virginian parents learn a lesson from their own past experience and that of their savage predecessors? The corrective which we propose for the evil complained of, (and it is too serious for merriment,) is the immediate introduction of the manual labor system into all our institutions of learning. If this feature is introduced and kept up in them, with a prominence proportioned to its importance, our youth, who are educated in them, if not fitted for usefulness and distinction in the departments of law, medicine and theology, will not be utterly "spoiled" as the sons of the *red men* were; but will be good "runners," useful and respectable laborers, mechanics, planters, and farmers. This after all, is the population, of which, more than any other, Virginia needs an increase. The low state of mechanic arts and of agriculture among us, or rather the prevailing vice of *indolence*, is the true source of the present disasters which are so often made the theme of popular declamation by stump orators and upstart politicians. It is *indolence*, more than any or every thing else, that checks the spirit of enterprise; that covers this fairest portion of our continent with *sackcloth*; and spreads over it the sable shroud of desolation. Let then a revolution be effected in our system of education. Let our youth be trained for the duties of practical life. Let them be instructed in what is useful, as well as ornamental; and let them bring minds stored with the riches of learning and science, to bear and act on *the subject of most absorbing temporal interest to the American people*, I mean the neglected subject of *agriculture*, and all will yet be well. The citizens of the south will then be independent indeed, and not in boast. Labor, like "marriage," will be "honorable in all." The work which misguided abolitionists are laboring with a zeal that would be becoming in a better cause, to perform by a meddlesome and violent interference, will be effected by the gradual and voluntary agency of her own inhabitants. Her population will multiply. Commerce will thrive. Barren fields will be clothed with verdure. The productions of the earth will be increased. Crowded cities and smiling villages will spring up. The halls of legislation will be occupied by the hardy and virtuous cultivators of the soil, the men of all others the most safe to be entrusted with the enactment and administration of laws. Colleges, academies, and schools, will prove the nurseries of enlightened, healthful, industrious, and happy freeman; and Christianity, untrammelled by the obstacles that now so powerfully impede its progress, with a field wide and waving with a luxuriant harvest open and inviting before her, will send abroad her genial and regenerating influences, and render this the Paradise of lands.

DIFFERENT EFFECTS, COMPARED, OF THE GREEN SAND, CALCAREOUS MARL, AND THE MIXTURE OF BOTH.

[We are much gratified in being able to present the following practical statements upon a subject which is not only mysterious in itself, and has as yet been inexplicable, but which has been rendered still more obscure by all the mass of writings on the subject. Imperfect and defective as are the following statements, if considered as *data* on which to found a theory of the action of green sand, they are the first which we have seen, of undoubted authority, which throw much light on the subject. Our correspondent generally and correctly discriminates between what are indeed three manures of very different kinds, viz.: Green sand alone—calcareous marl alone—and any mixture of the two. These have been so generally confounded under the one general name of *marl*, that facts have been misconstrued, and therefore false deductions necessarily made, even when there was no other cause for error. Our general views on the difficulties of this subject, were stated at page 86, vol. 4, and therefore will not be here repeated. We will only request of our correspondent that he will refer to those observations, and state whatever his experience may offer in confirmation, or in contradiction, when he writes his promised continuation. Almost every thing is yet to be learned respecting "green sand."

It is inferred, from our correspondent's remarks, that in all the extensive marlings on the borders of the Pamunky, the green sand has been largely intermixed with the calcareous matter. On the contrary, all the marlings referred to in the Essay on Calcareous Manures, or that had been then executed or known by the writer, were of calcareous marl alone, with the exception of the small portion mentioned (p. 48 2nd ed.) as being dressed with what was called the "gypseous marl" lying under Coggin's Point—which marl was there treated as a substance of rare, peculiar, and valuable qualities, and which in fact is rich *eocine* marl, containing green sand as well as gypsum.]

To the Editor of the Farmers' Register.

Chericoke, King William Co. June 9th, 1836.

Dear Sir: In your favor of the 24th ultimo, you request that I will give you my views respecting green sand marl, for publication. As upon the score of giving and receiving agricultural information, and particularly upon the subject of marls, I am much your debtor, I feel disposed to comply with your wishes: if, indeed, any thing I can have to say, may be thought worthy of the public notice. And, indeed, I should not have waited your request, had I thought that the results of my experience in the use of marls, would have at all been interesting to any one, or have made one convert to its use—as there is no one more alive to the interest and welfare of his country than I am, or more anxious for its agricultural improvement—nor can any one be more satisfied of the utility, nay, the necessity there is, of the use of calcareous manures with our soils, to enable us to arrive at a profitable, much less a high grade of agricultural improvement.

Your views (as contained in your Essay on Calcareous Manures,) respecting our soil, and the nature of putrescent manures, entirely accord with my experience: and practical results, I look upon as the only sure test of all theories. There is certainly no abiding principle of fertility in putrescent manures alone, nor do I believe land can be carried to more than a certain degree of fertility by their use; but by the addition of calcareous matter, I think it would be difficult to affix limits to the degree of productiveness that may be arrived at. You will doubtless say I am an enthusiast: well, perhaps I may be somewhat sanguine in my temperament, but zeal I think is a good fault in a farmer, particularly where it is tempered with reason and experience—and I shall say nothing in which I am not warranted by my own observations of cause and effect. And certain it is, that unless agriculture can be carried to a much higher grade of profit, than it has hitherto attained among us, the Old Dominion must be abandoned, sooner or later, by at least the present occupants. But I find I am fast getting off from the subject of your inquiries, and must therefore rein in my pen, and come back to the starting place, which was, I think, my experience, or rather views, respecting the green sand marl.

My experience with the green sand is limited, perhaps too much so to say any thing about it; but the green sand marl I have been using for 4 or 5 years; indeed, all the marl on this river (Pamunky) is of that character; different locations differing greatly, as to the quantities of the different ingredients. Some of the locations contain a large per centage of gypsum; some are of gypsum and green sand. Some contain the two former, with lime in a goodly ratio. Some, perhaps much the largest deposites, contain no gypsum, but about equal quantities of green sand and lime, say 34 or 35 parts of each. What Professor Rogers calls the pure green sand, contains but little lime, and no gypsum; but you find interspersed among it all, as far down as I have gone into the lower, or third stratum (reckoning downwards) of the tertiary formation, more or less of shells, and differing from the stratum above it in the shells being generally whole, but easily broken with the fingers. Some very large and perfect specimens of the *cardita planicosta*, and many very minute shells of a different species, but also perfect—whereas the stratum above it is exceedingly rich in lime, containing perhaps 60 or 70 per cent. of shells, almost all decomposed, or in a state of lime, with much green sand. In the most abundant deposites, above referred to, containing about equal parts of green sand and lime, the particles of green sand are about as large as fine gunpowder, which when taken on the point of a knife and marked on the nail, produce a fine verdigris color; whereas in the higher qualities of green sand, the particles are too fine to detach. The former, I suppose, is what is called the "gun-powder marl."

I met lately with Professor H. D. Rogers of the Pennsylvania University, at one of the banks on this river, and he told me that this was identically the same with the New Jersey green sand, that it appeared there in all the varieties it did here, with and without lime, but that some of the Jersey green sand was richer than any he had met with here. But the green sand of Jersey differs from ours in a geological point of view, being of the secondary formation, and therefore the shells differ from those of the deposite here, as to kind, but agree as to quality.

As I before observed, my experience with the green sand proper is limited. I had never heard of the name, much less know the value of the article, until last winter 12 months, when I met with Professor Rogers' paper on the subject in the Farmers' Register, previous to which, I had always rejected the green sand, when we came to it in working our banks: having tested it by analysis, as regards lime, and finding very little, I rejected it as altogether worthless. Since knowing its character, I have used a good deal of it; but do not think we have had time enough, yet, properly to test its merits: however, as far as we can judge, so far, its effects are flattering; indeed in some instances very remarkable. The finest celery I ever saw grow, was in trenches half filled with green sand, and no manure; it was doubly as good as the rest of the square, (which was also good,) cultivated in the usual way, the trenches well manured, but without green sand or marl. I also tried it on a galled knoll, where the soil was entirely washed off. The land was lightly sprinkled with straw, a part was dressed with marl, containing a goodly portion of lime, and some green sand—good marl, but not the best quality. The other part was dressed with green sand, both at the rate of 200, or 250 bushels to the acre. Where the first was applied, the land gave some signs of vitality, (the whole piece being planted in corn.) Where the green sand was applied, there was a smart growth of corn, with pretty good ears, the other producing none. But the most decided proof of its beneficial effects, was evidenced on cotton. I selected, as I thought, the poorest spot on the farm where I reside, the spring of 1835, (being a part of one of those cattle-starving, comfort-killing appendages, called a standing pasture,) and fallowed up a few acres which I put in cotton; the whole was manured in the drill with coarse litter. On about 3 acres, the litter in the drills was top-dressed with green sand at about 100 bushels to the acre; but I should observe, that this green sand was of an inferior quality to that used with the celery and corn, not being from the same deposite, and being the upper, or overlying stratum of the tertiary formation, containing about 30 per cent. of green sand and 5 of gypsum, most of it having no lime at all. On another acre, old ashes in about the same proportion were applied, in the same way, and the cultivation was precisely the same on these 4 acres, as on the rest of the patch. Where the green sand and ashes were put, I could see no difference: but between that, and where no marl or ashes were put, it was as five to one or more. Where the green sand and ashes were applied, the cotton was of fine size, and as well branched and bolled, as I ever saw cotton, while that of the other was small and trifling—scarcely worth any thing. The green sand first spoken of, as being used with the corn and celery, I also used with cotton, upon land that had never before brought cotton, although frequently tried, being very light and sandy. It was used in the same way as the other, in the drill, with coarse litter: the crop was very fine for the year, maturing very early, and the staple good; it was decidedly the best cotton I saw last fall, and it was all open before the first frost. This piece of land, though, had been previously marled, and therefore I cannot say how much the green sand is entitled to claim for the crop. I tried the green sand also on cimlins the last year, but could see no effect; those on which none was put, being as good as where it was. They were all good, but I could ascribe nothing to the green sand.

My next experiment at home, was with turnips, both ruta baga and common white, (for here I have only been using marl since last summer.) The land was prepared as for the cotton, except that the litter was not so good, the drills four feet apart, the manure spread in time and top-dressed with green sand marl, being about equal parts of green sand and lime, say 34 or 35 parts of each, at the rate of 100 bushels to the acre; the land was then bedded on the litter, and the turnips sowed on the top of the beds. This was ordinary land, not good for more than 3 to 4 barrels of corn to the acre; it was forgotten to leave out any rows without marling. The fall was said to be a bad one hereabouts for turnips, but the whole crop was excellent, perhaps the best I ever had. The only difficulty with them was, that the marl forwarded them rather too much for winter keep.

In September and October, I marled about 50 acres of clover fallow for wheat at the rate of 200 bushels per acre, the marl being that last spoken of, equal parts of lime and green sand. So far the wheat promises well: without additional disasters, or an increase of the strut, with which it is seriously affected, it will probably make 20 or 25 bushels per acre.

The effect, or supposed effect, of marl on this wheat, I should not have mentioned, as the land was in good heart, and had a good growth of clover on it, but for the fact of the field, (which is all light land,) having several sandy knolls in it, which had no clover on them, and which I scarcely ever saw bring wheat or corn; and I can now see but little difference between those spots and the rest of the field: *that* certainly proves something. The land was fallowed with three-horse, or rather 10 inch Davis ploughs, the marl then spread, and reploughed with smaller ploughs as shallow as possible, the wheat then sowed and dragged in both ways, so as to mix the marl as perfectly as it could be effected.

On the plantation where I commenced marling 4 or 5 years ago, all has been realized that the most sanguine could have anticipated. The open land will be nearly finished this year once going over, at about 250 bushels to the acre; and the farm now presents an entirely new face. Where three years ago there was a sparse growth of hen's grass, now is the most luxuriant clover. The first land I marled there, was a very poor piece of hen's grass indeed; the next year it came into corn, when it received a light dressing of coarse manure. The corn was good, say 6 or 7 barrels at least; it was followed by wheat, which was also excellent, and the clover is now, I dare say, as good as any I ever saw. I find the deep blue marl, or having that appearance in the bank, containing most green sand, decidedly more beneficial than the lighter colored or gray marl, containing fully as much lime, but less green sand—as will the green sand marls generally on the river, producing a much more prompt and efficient action than the white, or miocene marls of the forest, although the latter contains a much larger amount of lime, than any of the eocine, or green sand marls. But it all repays the farmer, with compound interest, for its use.

As far as my experience goes, I find that with all marls, or rather calcareous matter, such as we call in this country marl, it is time thrown away, or worse, at least for the time being, to apply marl without vegetable matter of some sort. Stable and farm pen manure, and clover, of course are best to use with it; but I find any vegetable matter answers well in sufficient quantity. From my present experience with the use of marls, I certainly prefer the mixture of the green sand and lime, or what we call the green sand marl, to either green sand or lime alone. The green sand marls seem to exert a wonderful effect on clover, and all grasses with which I have tried it. It certainly forwards to maturity too, all crops with which I have used it; cotton, I think, 2 or 3 weeks at least. The fallow wheat to which I have referred above, is now at least ten days forwarder than any in the neighborhood of the same kind. I have found the only way to marl efficiently, was to have a detailed force, set apart from the crop, and kept constantly at it. We never stop our carts when the weather will permit hauling, except in harvest and seed time.

A good many are now beginning to turn their attention to marling in the forest, and some on the river; and in every case where it has been judiciously applied, the same good results have attended. And I see no good reason to doubt, why the fondest anticipations of the patriot and philanthropist should not be realized, as regards the tide-water section of Virginia—if the people will only shake off that lethargy and inaction which it seems so easily besets them, and use the means aright with which nature has so abundantly supplied them.

My views and experience upon the transportation of marl by tide-water, as well as the utility of a rail road, intersecting the heart of the eocine district, across from Richmond to the Rappahannock, &c. &c. I must defer for another communication, if you think them worth notice.

I have now, sir, given you a crude synopsis of my experience with the green sand marl, and somewhat, my views respecting its use. Should you be able to winnow any wheat from the bulk of chaff, which you may think would add to the general fund of agricultural information, or at all interest or benefit any of your readers, it is at your service to dispose of as you think proper—to give it to the public, or throw it aside as worthless.

C. BRAXTON.

From the Cultivator.

ON THE MANUFACTURE OF BEET SUGAR IN THE UNITED STATES

Paris, April 15, 1836.

MY DEAR SIR—A long space of time has elapsed since my last communication to the State Agricultural Society. Meanwhile I have not had a moment out of mind the promise I made in it to resume the pen as soon as I should have something worthy of being recommended to their attention. It is long since I have been convinced of the vital importance for France of raising the beet root and manufacturing it into sugar. Some time after my last arrival in the United States, some of my friends wanted me to encourage it in America; one of them, chiefly, who had seen my successful establishment at my estate in France, and who knew I had received from the French government the gold medal offered for the best making of the beet sugar; but I could not recommend it for the United States, when I had witnessed how few had succeeded in this country, even during the reign of Napoleon, when sugar was four times the price it is now. Indeed, after that time the working of the beet sugar was entirely given up in Europe, except in France, where even I was almost the only one who would not give up so easily the hope of the great advantages that discovery was to offer one day or another; to a great part of the world. The benevolent monarch who succeeded the great emperor, was soon persuaded that there would be a great benefit for France in encouraging this new branch of agricultural industry. However, nothing more was found necessary to accomplish the object than a simple honorable reward for the most successful; for if the making of beet sugar was really useful, it would soon be proved by the benefits the manufacturers would make. The price of sugar had fallen more than one-half and many persons who had invested great capitals in the undertaking, met with very serious losses. However, several continued, and new improvements were keeping pace with, and even overbalanced the disadvantages of the constant lowering in the price of sugar. But, sir, I could not give any encouragement in the United States to similar undertakings before the improvements in the manufacturing of beet sugar were made. I am persuaded that it would have been the cause of complete failure in the attempts made by any one till very lately, though it has given great profit to some great establishments in France for a few years past. This I will demonstrate when I enter into more detail.

For the present moment, what I have said above will be sufficient to answer the double purpose of justifying my reserve upon this, so interesting subject, and deserving at the same time the confidence I wish to attain now, when I recommend the cultivation in the United States of the sugar beet, without any further hesitation, for the purpose of manufacturing it into sugar. I am convinced that it will be a very advantageous agricultural pursuit in all parts of the United States, and chiefly, in the middle and northern states. The great difference in the price of labor between France and America, which in the account of profit and loss, has produced a balance against the United States in the contemplation of this operation, is now overbalanced by the new discoveries and improvements in the fabrication of the beet sugar. To them, add in favor of the United States, the cheapness of the soil for the cultivation of the beet, and of the fuel for manufacturing the sugar. Those advantages are to be found in all the new states, and some considerable parts of Pennsylvania and New-York. There, also, they will have on their side, in uncommon abundance, the fine water powers, which more than any thing else remedy the difference in the price of handwork between Europe and America.

But, sir, while I was admiring here, in the splendid establishments of this new industry, their fine machinery and their improved chemical processes, I was lamenting that the small proprietor or the farmer could not employ directly his produce by manufacturing himself. I am but just now perfectly satisfied that he can do it, and that with very inconsiderable expense, and without hiring any help; but simply with that of his family. I will quote the particular instance of a farmer in the north of France, (near Valenciennes,) who has received a medal from the Royal and Central Agricultural Society, for havig established on his farm one of the first small beet sugar manufactories, where he makes daily, without any assistance, but that of his family, 100 pounds of sugar fit for family use without further preparation. The whole house room consecrated to that purpose, is a room 16 feet square, and a cabinet 10 feet by 12. Now, sir, you can undoubtedly appreciate at once all the advantages that a farmer can reap in cultivating and manufacturing the sugar beet. It will be greater yet for those who have, as in the north of Pennsylvania and New-York, the maple sugar. The making of beet sugar may begin in October, and end commonly in March; it is just at the moment when the maple sugar is more commonly made; so that the same implements will answer for both manufactures, and the farmer will have employ for his family during the months when they have most leisure.

The Royal and Central Agricultural Society have just offered several handsome premiums, for whoever will communicate within this year the best methods for manufacturing the beet sugar on small farms. This has given me the idea of not waiting for my arrival in America, for recommending immediately the cultivation of the beet so that experiments may be made this fall and winter, by employing some of the best systems discovered here, and such as the inventive genius of Americans will not fail to discover.

I remain, my dear sir, with sincere regard,

Yours,

LE RAY DE CHAUMONT.

HON. JESSE BUEL.

P. S. I should have liked to add some notes upon silk and mulberries; but Mr. Tallmadge, with whom I am going to-morrow to see one of the largest establishments in France, will publish something upon the subject. If beet seed enough cannot be procured, a pretty large quantity will be found at Messrs. De Launay, Burgy & Co. in N. York.

ADULTERATION OF MILK IN THE CITY OF NEW YORK.

Extract from the New York Farmer.

Of the various animals, whose milk is employed for human food the cow, both in respect to quality and quantity, is most generally preferred. Goats', asses', and mares' milk are used; but for convenience, nutritiousness, and quantity, the cow is above all others to be chosen; and as far as food is concerned, may be considered among the greatest blessings which Divine Providence has bestowed upon mankind. As matter of diet, there is nothing which in proportion to its weight contains so much nutriment; and as a beverage, to a simple and unadulterated taste none can be more grateful. In the country, where it can be had pure and in abundance, it ought to constitute the great article of food for children and young persons; and the miserable and pernicious and perfectly innutritious substitutes of tea and coffee ought to be kept entirely out of their reach. In cities, however, pure milk is almost as difficult to be procured as pure water. In New York city, for example, the milk is first deteriorated, if we may be allowed so to state, in the cow's udder;—that is, where cows are fed upon distillers' swill, with scarcely any meal, and with barely hay enough to form a cud, the milk produced is of a very inferior quality; besides, with a large proportion of the milk-dealers, though not with all, it undergoes the ruleable and established dilution of one quart of water to four of milk; in addition to this, if it goes into the hands of the grocers, as in general they are too *modest* and *humane* to sell any thing like *strong* drink, it commonly undergoes another application from the town-pump. Indeed, we state upon the best information, that there are grocers in the city, who, without any aid from the cow, or at least the slightest possible, have offered the milk-men, when the supplies of the milk-men for their customers fall short, to furnish them from their own (the grocers') resources, what they may need to make their supply sufficient: that is, they literally manufacture the milk, as we sometimes say, "out of the whole cloth." The process, we understand, is this: to take some Indian meal of the white gourd-seed variety, and pass some scalding water through it; and this water dashed with a slight touch of milk, as Bloomfield calls it, "three times skimmed sky-blue," *can be afforded* at about five cents per quart; and at this rate is actually vended to the poor forlorn wretches, who want their cent or their two cents' worth for their tea and coffee. Now whether this be or be not a real Yankee trick we shall not venture to surmise, but the ingenuity of its performance belongs to the veritable city of Manhattan. It is however all of a piece with many of the London tricks, which London cream is readily manufactured out of flour or magnesia, and milk to a consistence to suit the most fastidious. The adulterations of human food, however, where it is susceptible of being adulterated to a profit, are most obvious and enormous, and it would be quite fortunate if all of them were as innocent as the above.

From the New York Farmer.

HAY AND HAY MAKING.

The season of hay cutting is just at hand. An operation so simple as that of cutting and curing hay every farmer feels that he understands, and would disdain on this subject any attempt to advise or instruct him. Be it so; the wise are glad to examine any subject, on which it is possible discussion or inquiry may throw some light; correct prejudices, or suggest new and better means of management; the wise in respect to any and every subject are never too wise to learn; and though our own observations or suggestions on any subject may have no just foundation, nor reasonableness, and no pertinency, they may be useful if they excite the inquiries and elicit the observations of wiser or more experienced minds.

Hay making must be set down as one of the most important operations in husbandry. Hay with us is the great means of supporting our live stock. Our straw is principally used for litter or the subsistence of our young cattle. Grain and meal are always given with reluctance, excepting to fatting cattle; and comparatively no succulent vegetables are grown for the winter keeping of our stock. It is hoped in this latter case there may be a speedy alteration in the habits of our farmers; and that it will become as much matter of custom among our farmers to raise large crops of vegetables, with which to store their cellars as large crops of hay with which to fill their barns. Common white turnips, though very little in favor with us are a valuable crop both for sheep and neat cattle. The yellow varieties are still better, as they are more solid and retain their good qualities much longer. The ruta baga is a most excellent vegetable for sheep, cattle and horses. Potatoes, carrots, mangel wurtzel are all excellent. An agricultural friend, well qualified to judge, informs me that he prefers to all others the common blood beet. He asserts that according to his own experience, it is as sure a crop as any other; that it yields as much to the acre as any other; none will make more milk, or put on more flesh; none if properly taken care of will last longer; and none of equal value is raised with more ease or at less expense. My own experience in their cultivation and use disposes me to give almost entire credit to all these statements.

It would seem to be most important to the health of our animals, especially considering the length of our winters and the time during which they are confined to the stall, that they should have green and succulent food to mix with their dry; and that dry especially not of the best quality. Certainly very much of our hay is spoiled in the getting—it is cut not at the right time. It is made either too much or two little; so much as to become too husky and dry, or so little as to be heated and mouldy; in either case much of its nutritive power is lost; and though it may sustain life, cattle by the use of it lose their condition and become diseased; poor, hide-bound, costive and consumptive.

The time when hay should be cut is a matter not well settled and in which farmers in different places differ with each other. Different grasses ripen at different periods; and with some the season of flowering continues much longer than with others. It is ascertained likewise by chemical analysis that grasses at different periods of their growth yield more nutriment than all others. What in some parts of the country is called the English Bent, a fine and delicate grass, must be cut very early, or it becomes hard and wiry. Herds grass or Timothy grass, according to the experiments of Sinclair, must be allowed to reach an extreme ripeness in order to yield the greatest amount of nutritive matter. We have some incredulity in regard to the statements respecting this latter grass, and some hesitation whether these experiments, though highly exact and instructive, are to be considered conclusive as to the actual value of these grasses for feeding; and should deem some exact experiments with the cattle themselves made under favorable circumstances and by skilful and careful observers, much more decisive.

The time of cutting for most grasses is when they are in flower. If cut before this, they waste greatly and have little substance; and if suffered to stand long after this, they lose their succulence. It is advisable in this matter to be early, rather than late; and to cut before the plant is exhausted by flowering, or by forming seeds. It is then in the highest perfection. The time for cutting clover is longer than of other grasses, as it continues longer sending out a succession of flowers; but I am decidedly of an opinion that the sooner this grass is cut after it comes into flower, the better, as it is so apt to lodge and to become mouldy at bottom.

On the subject of the time of cutting grass I am happy to quote the opinions of a very able writer. "This rule of cutting grass, when it first comes into flower applies to every species of herbage, which is to be dried for winter food; but to coarse hay, the produce of wet or marshy grounds, it is strongly applicable; for most of the plants, which grow in these situations, when they are in full vigor, are as tender, and contain perhaps as great a proportion of nourishing juices as any other description of hay; and when cut at that stage and properly managed afterwards, form a valuable article of food both for sheep and cattle; but when the cutting is delayed, as indeed it very often is, till an advanced period of the season, when the plants have not only reached their ultimate growth, but begin to decay, this description of herbage becomes at once the coarsest and least nourishing of all food. This opinion does not proceed upon theory; but upon the solid grounds of experiments carefully made upon different kinds of herbage, at different periods of their growth, the result of which establishes a fact which cannot be two generally known, viz: that plants of all sorts, if they are cut when in full vigor, and afterwards carefully dried, without any waste of their natural juices either by bleaching with rain or exhalation, contain weight for weight, a quantity of nourishing matter nearly double what they do, when allowed to attain their full growth, and make some progress towards decay." These opinions are stated with great confidence; and are entitled to much consideration; and so far as they apply to our wet meadows deserve particular attention, since the cutting and curing of these grasses receive very little care; they are left standing generally until very late in the season; and the hay from them commonly is almost worthless, excepting for litter.

" In the survey of Perthshire, Eng. it is stated that as the great object of making hay is that of preserving as much of the natural sap as possible, the proper time for cutting it is when the crop of grass has attained its highest degree of perfection; when the plants are in full blow, and before their flowers begin to fade. If cut too green the hay shrivels and loses much of its bulk; if allowed to stand till the seeds are ripe, the stem becomes hard and wiry; the roots lose much of their natural sap; the aftermath is less abundant; and the principal part of the hay is in danger of crumbling away into short stumps, under the various operations which it must undergo. Better to be too soon than too late, especially if the crop be heavy and in danger of lodging."

" With clover the best time for cutting it is when the flowers are all fully blown and the earliest begin to turn brown. If allowed to stand longer, the roots of the stalks lose their leaves, and become hard and sticky; and the plant is so much exhausted that it takes a long time before it sends up new shoots."

With respect to curing hay, it is important to put it into the barn in as green a state as will possibly do and avoid its heating and becoming mouldy. In this way it best retains its succulence and flavor; and the nearer in both these respects it approaches to grass in its green state, so much better is it relished by all kinds of stock, and so much the more nutritious it undoubtedly is. The best farmers, on the Connecticut river, and where they are extensively engaged in the feeding of cattle, have within a few years been accustomed to put their hay in the barn in a very green state and after a slight making. They deem it of the first importance that it should have no foreign dampness adhering to it either of dew or rain; but they do not object to its heating slightly in the mow from the fermentation of its natural juices. They are of an opinion that this even renders it the more palatable for the cattle; but wetness either of dew or rain is altogether injurious to its quality: produces sourness, and mould, and renders it innutritious, unfit for the use of cattle, and extremely pernicious to horses. The English farmers think their hay is better for a slight heat in the stack.

Two things in the curing of hay are to be particularly attended to. The first is to secure it from wet. The effect of wet upon hay is like the effect of water upon tea to extract all its strength and flavor. For this reason the practise of some farmers of mowing in the rain by way of saving time, and suffering the hay to remain wet and entirely saturated with water in the swath, under the impression that it would suffer no injury though it should remain so twenty four hours, proceeds on very erroneous opinions; and is to be strongly condemned. The practice likewise of cutting grass when a heavy dew is upon it, is, on the same grounds to be disapproved, excepting that in this case that it is very soon stirred and shaken. We should prefer, excepting that we might sometimes find that it compelled us to the loss of too much time, never to have a swath mowed but when the grass and ground are perfectly dry. The grass is not mowed so easily when dry as when wet. It requires more strength and the edge of the scythe suffers more; but the grass, which is cut when perfectly dry and the ground under it likewise being perfectly dry and warm, is made with so much more quickness and ease, that this consideration, which will go far to balance the supposed or actual advantages in the other case.

The second important point is to avoid getting the hay too dry, and stirring it so much as to shake off the leaves. These constitute the most palatable and nutritious part of the hay; and this is particularly likely to happen in respect to clover, which if very much dried and shaken becomes little better than so many sticks. Clover can be well cured in cocks, without any turning, but that of reversing the heaps.—This method has been often tried and with entire success. Salt is always to be applied in these cases at the rate of a peck to a load; and to all English hay the addition of salt to the amount at least of four quarts to the load is always to be recommended.

Spreading out, as it is termed, is an operation that should be done by a most careful hand. Clover hardly admits of this when green, and, if attempted when dry, the best parts of the hay are sure to be shaken off. Other kinds of hay however, cannot after mowing, be too carefully opened and too evenly spread; not a matted handful should be left that is not thoroughly separated and shook out. Hay at night, if it can be done, should never be left in swath or in windrow; but put up at first in small cocks and afterwards made with no more shaking about and spreading than is absolutely necessary to dry it. We have already extended this article beyond our intentions and yet have not exhausted it. We commend it to our brother farmers, not presuming that we can instruct them; but hoping that we may at least draw their attention to a subject of great importance in husbandry; but which we think has by no means as yet received sufficient consideration and care.

H. C.

LEGISLATIVE ACTION REQUIRED TO AID AGRICULTURE.

No. I.

Agricultural Professorship.

To the Editor of the Farmers' Register.

Airfield, July, 1836.

Sir: The devotion of your useful journal to "the improvement of the *Practice* and support of the *Interests* of Agriculture" has been beneficially felt throughout the State. The improvement of the *practice* embraces an extensive and diversified field; but the *interests* of agriculture are, perhaps, more ramified; since they are, either directly, or indirectly, connected with almost all the other interests of society. Is not agriculture the nursing mother of them all? And have not her interests been, not only too long neglected, but wantonly oppressed, for the benefit of others?

May I not ask, what practical, beneficial, and *separate* measure has our Legislature ever adopted to promote these interests? At the last session they were asked by an Agricultural Convention, to make a beginning—1. To appoint a Board of Agriculture for the purpose of superintending and supporting these interests and recommending subjects for legislative action—2. To establish a professorship of agriculture in the University, in accordance with its original design, and the intention of the founders of the Literary Fund—or, 3. To defray the expense of an agricultural tour through the Union, for the purpose of inspecting and embodying the most profitable and economical practices, pursued by the best husbandmen in other States; to be laid before our people for their information. Only *one* of these measures was asked for at that session; and it was hoped, that, at any rate, the least objectionable of them would have been adopted. Your readers who take a lively interest in this subject know with what indifference the memorial was treated. One of the persons designated to sustain the memorial before the "Committee on Agriculture," did not wait on that committee, because he had privately understood that nothing would be done, and knew, from long experience, the futility of attempting to overturn settled prejudices.

It has been thought (whether justly or not I do not say,) that this result was mainly attributable to a jealousy of the *University;* as it was apprehended that any action on either of the alternative propositions of the convention, would end in the establishment of the proposed professorship and experimental farm. It was asked in conversation, what claim the University had over any of the other colleges in the State?

Whether agriculture be regarded as a science or an art, it certainly admits of degrees of skill. The principles on which its whole theory and practice depend are to be learned; for, they are not innate, or born in us, like the germinating principle in the seeds we use. Their connection with several of the sciences is intimate; nay, in many instances, are borrowed from the sciences; and, in all, usefully illustrated by them. The ignorant, but successful farmer owes that success to his industry in *imitating* others, or, to the knowledge he has acquired by observation and dearly-bought experience.

It is proposed, by means of a professorship and experimental farm, to impart to such youths as desire it, both *theory* and *practice*. It would be in vain for a professor of chemistry or natural philosophy to attempt, usefully and successfully, to teach his class either of these sciences by mere oral explanations from his chair, unaided by the dumb, but more efficient instruction of an apparatus. And so it is in agriculture—where experiment is the great expositor. It is not so important that we make every experiment with our own hands, as it is, that we know the principles upon which each is made, witness, and carefully note the *modus operandi* and the results. Few proprietors in the south till their own soil; and, if, instead of trusting the mode, &c. of doing it to the presumption of uninformed, self-sufficient agents, we would plan every thing and supervise its execution ourselves, our graineries would be better filled and our lands rapidly improve. But, what an amazing difference would exist in our present condition, if, in youth we had been carefully instructed, both in the principles and practice of our vocation! How many disappointments and bad crops would have been avoided! How many once fruitful fields would have been saved from sterility and abandonment!

I doubt not but that you have been amused at the ignorance, curiosity and surprise of a person with beard on his chin, when he examined, for the first time in his life, the crops and all the appurtenances of a farm. There are many persons in Europe who have never been beyond the walls of their native city; and there may be some in this country who have spent their days in seaports and at sea. Such an individual may be very learned and accomplished, if you please; but, with what profound ignorance would he embark in farming or planting! He would have to learn even the names and uses of every thing. As all would be new to him, time and study and careful observation and an imitative talent to boot, would be necessary before he could make a living. Although few are so ignorant as this; yet, the majority of the young men among us are less informed than they might be, about what is passing around them, and which is of the most importance to them in their future rural pursuits. They have been otherwise engaged, and it has not been fashionable to direct their attention to any thing so low and vulgar! I concede it to be true, that every farmer's son knows the name and use of every thing on the farm before he begins to shave, and can contract with an overseer and have a crop made in the *usual* manner. But, how many of us have been instructed in the nature and characteristics of soils—the skilful use of artificial means to increase their fertility or renovate it when exhausted; to alternate crops advantageously—to cultivate in the most improved and profitable manner such as may be best adapted to the soil and to circumstances: in short, how many of us have been taught to apply the unerring principles of science to the details of our business, and have been enlightened by the recorded experiments and practices of the present and past ages? Would not a knowledge of chemistry, geology, mineralogy and botany have done us, and through us, our common country, more substantial good than all the Latin verbs and nouns the whole of us ever conjugated and declined in our lives?

I am sure there is no *ne plus ultra* to human genius and enterprise: and, perhaps, you will think so, if you but contemplate all that has happened even within your own time. Guided by the increasing lights of science and the dexterity of art, have not the improvements achieved by man, in nearly all his vocations, outstripped the visions of credulity itself? The extension of old, and the discovery of new principles, with their brilliant results would astonish the most sanguine, as well as the wisest philosophers of any other age, if they could reappear upon earth. Need I recount the victories of *genius;* the wonders of *invention;* the splendid, herculean achievements of *enterprise* that so signally characterize and adorn the proud epoch in which we live? It is, indeed, an age of "successful experiment." And, shall it continue to be said, that every other interest but that of agriculture has been fostered and encouraged, as well by legislative action, as by associated wealth, and is moving onward with constant and increasing celerity?

In the midst of this unparalleled excitement and energy, it would have been strange if the impulse had not been communicated to the agriculturist: and we see him, measurably, roused from his lethargy, both by the novelties of the day and the increasing demand for the productions of his industry. The operation of this stimulus upon individuals of his own profession has produced improvements that are slowly spreading abroad; carrying conviction wherever they go, that husbandry is susceptible of a vastly wider range of usefulness and profit; and, if properly cherished by government, is destined, soon, to occupy the most dignified and honorable place among the pursuits of man.

The disadvantages under which individuals labor in making the experiments necessary to develope facts and principles, so essential to "the improvement of the practice of agriculture;" the tardiness with which *favorable* results become generally known and acted upon, and the fact that unfavorable results are hardly ever known beyond a circumscribed circle, have created in the minds of many intelligent citizens, an anxious desire that the Legislature should take "the interests of agriculture" under its special patronage and protection. These considerations induced the meeting of the convention which assembled in Richmond last winter: and I am gratified in believing that the subject, though so unceremoniously "laid on the table" by our law-makers, continues to occupy its relative importance, and excites an increasing degree of public solicitude. Indeed, it seems impossible, but, that, every mind endued with reflection and patriotism, must participate in this solicitude; and, especially, when the wretched condition of our husbandry is compared with its intrinsic importance to every other interest, and with the declining power and glory of the commonwealth! Why is it that such armies of our citizens semi-annually abandon the land of their nativity and all its hallowed recollections—carrying with them that mass of intelligence, wealth and enterprise which subdues the wilderness and makes it blossom as the rose? Is it not because of the impoverishment of Virginia, and the neglected and humble condition of her agriculture? Is there a land on earth with a finer climate, or more natural advantages and resources, or with a soil more susceptible of the highest state of improvement? All our staples are of the first importance; and, when cultivated on rich lands that have never been exhausted, or, that have been highly improved by the skilful use of artificial means, yield a *profit* even greater than is derived from the most fertile soils of the west, except, perhaps, the cotton and sugar lands. This may be doubted by many; but, of its truth, I am thoroughly convinced by the results of actual observation. I am inclined to the opinion, that, if two farmers, with precisely equal, but ample, means, were to commence the same time on equal quantities of land; the one in the richest *woodland of the west*, the other in any favorable and improvable part of Virginia, and were to live for twenty years at the *same* expense, hoarding the balance of their incomes, the Virginian would have the most money at the end of the time; *provided* he adopted the most improved system of ameliorating his soil and cultivating his crops, &c. His land would be continually improving, and would not, in that time, have reached the highest state susceptible of improvement; though its production in quantity (which is rather improbable) might equal, if not exceed that of the other. The difference in the *prices* of his marketable articles and of his necessary purchases would swell the surplus of the Virginian. Would not the cost of moving and making settlements on the new lands of the west, if wisely expended in improving those abandoned, make the latter, in most cases, most valuable and desirable? However, it has been "testified" by the best and wisest man that ever lived, "that a prophet hath no honor in his own country;" and eighteen centuries prove the truth of the remark. How many migrate under the influence of this fact, it is unnecessary to enquire; for, multitudes leave us with no other than a pecuniary object, leaving behind an ample and unoccupied arena for all their means and enterprise, if they were only contented, and would believe so.

But, what hope is there of arresting this flood-tide of depletion, unless the Legislature shall, at once, take agriculture under its protection, elevate it to the honor of a place along side of the most favored arts and sciences? One half of the sum annually wasted by them in listening to the vain and unfruitful oratorical displays of the young lawyers among them, would fully meet the expenses of a professorship and pattern farm. But the execution of this, and the adoption of such other measures as may, upon reflection, seem calculated to instruct us in the best modes of culture and management, could not involve an expense worthy of a moment's consideration by those to be benefited by them. If the fear of incurring the displeasure of the people prevented our delegates from "taking the responsibility" last winter, they have now time to agitate the subject among their constituents, and collect their sentiments. And I invoke your aid, Mr. Editor, and that of every other friend of the good cause in the State, in rousing the public mind to a proper consideration of this subject, in all its interesting aspects. I assure you I feel no interest whatever about it, beyond that which every other citizen who loves Virginia ought to feel. It concerns us all, no matter of what calling; whether land-owner or not.

The legislative authority of almost every State in Christendom has been exerted directly in promoting agriculture: and why should Virginia stand, a solitary exception; and that too, when her husbandry, in all its departments, is comparatively, so far in the back ground? Most of our law-makers are, themselves, *interested* in the subject; but no feeling of disinterestedness or mawkish sensitiveness about providing for their *own interests* ought to restrain them; since that interest is common with that of their constituents. The fear of censure for expending a few dollars in so good a cause is unworthy of any man who has been honored with the confidence of the people. Is there a man among us so contemptibly mercenary as to refuse to contribute a few cents, (say one or two cents per head on the population of the State,) to place the primary interest of the Commonwealth on a footing of greater respectability and advancing improvement?

If it be asked, what can the Legislature do? I answer, comply with the request of the memorial of the convention.* Let them look into the laws of other countries as well as those of our sister States—collect all their measures in aid of husbandry—examine into the results of them—and adopt such as may be thought to be suited to our wants and circumstances. Nor would it be unavailing, respectfully to weigh the merits of every plan that may be suggested, and expend a small sum in testing the practicability and utility of the best of them. If I had access to the necessary books and documents, I would, cheerfully, lay before your readers, an abstract of what has been done elsewhere. Perhaps some of your correspondents may be more fortunate in this respect than myself, and can spare the time to do it. Many persons would like to see such a statement, and it might have some effect in stimulating both the public mind and the movements of the Legislature. I do not know that the public libraries at the seat of government and our literary institutions have been, or have not been, enriched by the books and documents containing this information. If they have not been, it is a reprehensible omission that ought to be supplied at once.

But, it has been asked, what superior claim the University has over the other institutions, to a professorship of agriculture and a pattern or experimental farm? The answer is so obvious, that the question plainly indicates an improper jealousy of that valuable institution. Is not the University the highest school of learning in the State? Does it not embrace the widest range of science? Is it not supplied with the most extensive library, apparatus, &c.? Is it not the resort of the greatest number of youth, and regarded as best calculated to add the finishing touches of education? And is not its position most central, as well as in as fine a section of country as any in the State? Such an experiment as that proposed, could not, therefore, be so fairly made any where else, if gentlemen insist on calling it an *experiment*. If local advantages are to result, they would, necessarily, be enjoyed at any other place. Though I do not agree that these advantages will be confined to that place; for, the benefit of them will rapidly spread to the remotest corners of the State and far beyond them. Every valuable developement of science and experiment will instantly fly through all the channels of communication, and enlighten the mind and practice of the husbandman in his rural and most sequestered abode. The young men who annually return to the bosom of their families and friends, will also bring with them liberal and enlightened views and a cultivated taste for rural pursuits. Husbandry will be elevated to its just rank, and the learned professions (gratuitously so called,) will no longer monopolize so much genius and talent, nor be the graves of so many of our young men. Public sentiment will be gradually turned in favor of the certain profits, the real comforts and quiet joys of agriculture. The streets of your cities and market towns will be less crowded by eager and desperate speculators; by gay drones and fashionable voluptuaries.

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*Would it not be well for the Farmers' Register to re-publish the simple propositions or requests, as set forth towards the close of the memorial alluded to? See Far. Reg. vol. iii, page 625, February No.

When this happy change shall be effected, may we not confidently hope that the rich resources of our State; the enviable advantages of our climate, soil and location will be more justly appreciated—that the ancient glory and renown of the Old Dominion will be relumed—and, that our society will find its strongest and most congenial cement, and substantial happiness, in the dear land of our fathers.

Yours, respectfully,
CLAIBORNE W. GOOCH.

No. II.

Board of Agriculture—Agricultural Tour.

To the Editor of the Farmers' Register.

Airfield, July, 1836.

The Legislature is asked to establish, upon a plan similar to the one adopted in New York, a Board of Agriculture. It might consist of one member from each congressional district; to be elected for two years, either by the people or the General Assembly. They ought not to be permitted to serve more than two years at a time; and, perhaps, it would be best for half of the Board, annually, to consist of new members. This accession of fresh zeal every year, to be tempered by the reflection and experience of the old members, would be attended with good results. Such a Board could not fail, at least, for some years, to be highly beneficial to the interests of agriculture. It would diffuse throughout the State much useful information, and inspire a livelier interest in rural pursuits. It might be the instrument of embodying and disseminating a knowledge of practices and improvements that too often remain long confined to particular neighborhoods, and dissipate that cloud of prejudice in favor of ancient courses, that so much retard the success, and diminish the profits of the husbandman. Thinly scattered, as we are, over an extensive territory, we are, generally, without the means of comparing principles and practices, or of learning, in any authentic form, the results of such experiments as the means and enterprise of individuals, even in Virginia, enable them to make. The *Farmers' Register* is a valuable vehicle for the communication of such information, I grant; but, only a few of the more wealthy of our population subscribe to that work; and still fewer employ its columns for that purpose. And, when they do so, it is too frequently in the form of anonymous communications, that seldom command that attention and credence, due to real and respectable names.

But, the *prejudice* against every thing new, however valuable, in husbandry is as deep-rooted and general, as it is pernicious and ridiculous. Something is necessary, to exterminate it, if possible, from the minds of *men*, and guard those of *youth* from imbibing it. Would not the eradication of this noxious weed be worth all the expense, both of a Board of Agriculture and an Agricultural Tour? Those who have the means of making experiments in a limited way, or step out of the beaten track of their neighbors are sure to be pointed at, as mere *book farmers*, and to lose reputation for good sense. Should they fail, even in *one* among many praiseworthy attempts to improve in tillage or management, they become, at once, butts of ridicule; their credit suffers, and perhaps their solvency is doubted. If they meet with success, it is ascribed to mere chance or lucky seasons. When new and valuable discoveries are made, they are disseminated with such a snail's pace, that it takes years for them to get beyond the neighborhood.

It is too generally believed that there is no art or mystery in husbandry; that it requires no education, and a very ordinary share of common sense and intelligence. Nay, more; it is the prevailing impression, and probably with two thirds of the people, that a well educated man, with a cultivated and expanded mind, is wholly unfit for agriculture! In what can this, most absurd opinion originate? May we ascribe it to the fact, that all our young men, possessed of these advantages, have been, hitherto, devoted to other pursuits; that, when they do settle upon farms, they leave the management of every thing to overseers; (who frequently can neither read or write!) or, if they undertake the management themselves, that, from not having had their minds, in their youth, directed to, and instructed in, the principles and practice of husbandry, they so often fail, and have to sell out; or, at any rate, blunder along, and spend half their patrimony, before experience teaches them the ordinary skill, and gives its consequent success? But, no matter to what causes such an impression may be owing, it ought to be removed. And is there any better way of doing it, than, for the Legislature to take agriculture under its protection, and elevate it in public opinion? It has been said, that the character and chief interests and pursuits of a nation may be ascertained by an examination of its laws. According to this test, what sort of an opinion do you think a stranger would form of us, after having read our code of laws? Would he infer that we were almost entirely an agricultural people? or, would he incline to think us a community of litigant speculators and traders?

If our fathers have prodigally dissipated the fertility of our lands, yet, skill and industry have power to restore it. All the other bountiful gifts of Providence still remain to us; and their great value is daily made more manifest. Long experience and the example of other communities prove, that the means and enterprise of scattered individuals are insufficient, promptly, to develope the advantages of new improvements, and to change, in any short period, the immemorial habits and practices of a whole community. Hence, it is very important, through the instrumentality of a *Board of Agriculture*, to concentrate, and then diffuse whatever valuable systems and practices that may exist in different parts of the State; and, by means of an *Agricultural Tour*, collect and disseminate a knowledge of those of our sister States. I grant that much of this information might be gathered from periodical publications. But it exists in such detached scraps, mixed up with so much other matter, that, if the materials were accessible to individuals, it would require much time and great labor to collate and embody it in a useful form.

A Board of Agriculture would bring with them the results of their own experience as well as that of the most successful husbandmen in their respective districts. Their own discussions and comparison of opinions would elicit much light for the benefit of the public; and they would be enabled to recommend to the Legislature the wisest and most beneficial enactments, both to "improve the practice and support the interests of agriculture." In whatever light such a Board may be viewed, it seems to promise benefits that would justify its establishment. Perhaps it may not be necessary to keep it in existence more than a few years. When it shall have stimulated and aided the Legislature in doing something for the drooping interests of the cultivators of the earth; when it shall have roused into active being, and given a proper direction to a becoming zeal in the pursuits of husbandry, its duties may well be superseded by a *State Agricultural Society*, under the immediate patronage and support of the Legislature. That such a society should be soon gotten up, need hardly be here suggested. I think it only requires to be proposed to ensure its organization the coming winter. May not the failure of a similar attempt heretofore, be ascribed to an improper organization and the want of legal aid? At that time the spirit of improvement in every thing else had not so far outstripped husbandry, as at present; nor did there exist so many urgent reasons to make exertions to increase the respectability and profits of the land owners, in order to keep them from migrating. At that time we had no public journal dedicated, like yours, to our uses, and calculated to keep together and reflect the value of such an association. When such a society shall be again organized, it is hoped that the officers and managers, and even its members will consist only of actual and practical farmers. To place the chief conduct of its affairs in the hands of any other description of persons, however elevated, by reputation for talent, by office, or by private worth, is to ensure its failure; to kill it, in the very act of its birth!

Let it be remembered that the Agricultural Convention which met in Richmond last winter, adjourned *to meet again, on the second Monday in January next*. It is expected that the friends of this measure will take steps in time, to insure a full meeting, and to embody as much zeal and talent as possible; and go prepared to compare opinions and act with union and energy. It is contended that the farmers and planters have a right to demand that something should be done in their behalf. If the measures, to which I have so hastily and imperfectly adverted, be not approved, then, let better ones be substituted, having the same great object in view. I am confident that such, when properly understood, will be gratefully received by the whole agricultural community. That community cannot be expected to acquiesce much longer in delay and indifference; nor be satisfied with the poor excuse, that "nothing can be done for their interest, more than by measures that collaterally support it." But my confidence in the patriotism of the Legislature, and in their disposition to do any thing for the public good, when they see clearly how it may be done, is such, that I am sure the members will, between this, and the time of their meeting, reflect seriously on, and enquire into, this vital subject, and be prepared to legislate wisely and efficiently upon it.

I am, very respectfully, yours,

C. W. GOOCH.

For the Farmers' Register.

ON THE USE OF THE OSAGE ORANGE (MACLURA AURANTIACA) AS FOOD FOR SILK WORMS.

Some months ago the Farmers' Register contained a translation of an interesting article by M. Bonafous, giving the result of an experiment on feeding the silk worm on the leaves of the Maclura. Although the authority of that gentleman may be regarded as decisive on any matter connected with the culture of silk; yet as many substitutes for the mulberry have been successively used and discarded, it was reasonable to suppose the Maclura might share the same fate. On trial however, I find it to answer all the purposes for which M. Bonafous recommended it; and as the silk business is becoming an important branch of industry of the United States, I am induced to detail, in corroboration thereof, the result of my own experiment.

In the month of May, I had a few thousand eggs to hatch; and during the three first ages the worms were fed exclusively on the leaves of the Maclura. At the commencement of the fourth age, they were divided into several parcels, with a view of giving to each a separate kind of food. About one third were continued on the same—the native mulberry was given to an equal number—a portion of the balance was fed on the Maclura and Chinese mulberry indiscriminately—and the remainder on the Chinese mulberry alone. During the process, I could not perceive that the worms manifested any partiality between the leaves of the Maclura and those of the Chinese mulberry: if they evinced any, it was certainly not in favor of the latter. But they greatly preferred *either* to the leaves of the red mulberry, some of which I would occasionally lay on the shelves, where they would suffer them to remain until compelled by hunger to eat them. On the contrary, when these which had the red mulberry leaves assigned to them, were furnished with a few of the Maclura, they would collect around the latter, and devour them with avidity, before they would begin to feed on their accustomed diet.

The relative value however of the Maclura and Chinese mulberry for the production of silk, was only to be fully determined after the formation of the cocoons. It may be recollected by those who read the article of M. Bonafous that he regarded the Maclura as chiefly valuable for feeding the worms during their early age; that subsequently they should be supplied with the mulberry, their natural food: and that though the former would produce silk of a fair quality, yet it would be inferior and in diminished quality compared with the product of the mulberry. I find this to be true as it regards the Maclura and Chinese mulberry, so far at least as it respect the size of the cocoon; but the Maclura is at least of equal value to the red or native mulberry. The worms fed on the Chinese mulberry, spun cocoons weighing from thirty to forty five grains—those raised on the Maclura and Chinese mulberry combined, made their balls somewhat lighter on the average—while the weight of those obtained from the Maclura and red mulberry respectively, was about equal, and still less than either of the preceding. The quality of the thread for the manufacturing purposes, I am unable to pronounce upon, not having yet submitted specimens to a competent judge. The cocoons were nearly all of a pale straw color.

If the value of the Maclura consisted only in furnishing food for the silk worm, it might from its extreme hardiness and consequent exemption from late spring frosts, be deemed worthy of planting: but when to this, other important uses to which it may be applied are superadded, it appears to present irresistible claims to our favor. I may therefore be excused for dwelling more at large on its merits, which have as yet scarcely begun to be appreciated, or even known.

In many parts of the United States the scarcity of timber has for many years been sensibly felt. Still our forests continue to disappear; and to mitigate the evils of this alarming destruction, efforts have frequently been made to substitute live for dead fences. It is believed however that hedges have not to any considerable extent answered the purposes of an enclosure. After all the trouble and expense bestowed upon them, they have in most instances finally dwindled away, and been rooted out. Hence it may be inferred that the plants used in their construction, have been too feeble in their constitution and therefore incapable of attaining the necessary size and developement. A plant that would unite these requisites would be a desideratum. Now it has been confidently asserted that the Maclura will make a most substantial and impervious hedge —a fact which cannot well be doubted by any person who will take the trouble to examine its manner of growth. The branches are thickly set, and the lateral ones almost uniformly take a horizontal direction: they are moreover armed with a number of sharp and very rigid spines, which do not disappear, as has been stated, after one or two years, but permanently remain. The plants grow with such vigor, that it would only require a few years, under careful treatment, to rear an excellent hedge from the seed. To those who are fond of the ornamental, it may also be recommended for the lustre of its foliage, and the magnificence of its fruit.

Hitherto, the means of propagating the Maclura have been rather limited. It grows but indifferently from cuttings, and not with certainty from slips of the root. The only mode which can be depended on for extensive increase, is by the seed. These have been seldom perfected on this side of the Mississippi, owing partly to the small number of trees which gentlemen have introduced into their grounds, and also to inattention to the fact that they are diœcious. With a knowledge of this characteristic, there is no difficulty in having them to bear abundantly. There is one growing in my garden, now seven or eight years old, which has matured its fruit for a year or two past, and which would have borne considerably earlier, had not the staminate plant perished, which was ordered with it. The one subsequently obtained was feeble in its growth, and slow in flowering. Last year the number of seeds which ripened, amounted to many thousands. These readily vegetated in the spring, and the seedlings are now growing in nursery rows as finely as could be desired.

I regret that I have not been able to compress my remarks into a smaller space; but before concluding, I will take the liberty to suggest to some of our enterprising seedsmen the propriety of obtaining a parcel of the seed of the maclura from its native forests. They may be gathered in any desirable quantity on the Red river and in the contiguous parts of Arkansas. It is the practice now to compass sea and land to discover a new vegetable for our tables, or a flower for the parterre; and while the seeds of these productions meet with a ready sale, in consequence of the increased taste for horticultural pursuits, it is not to be doubted that a considerable demand will also be found for those of a plant which will equally contribute to the ornamental and the useful.

T. S. P.

Goochland, 7th Month, 1836.

FRAGMENTS OF MY MEMORANDUM BOOK.

[The following article is formed of parts of the memoranda which the writer was formerly in the habit of hastily noting down, whenever his very limited opportunities for agricultural observation occurred, and which observations were generally directed to particular localities more by the compulsion of other circumstances, than by the mere object of seeking such facts and information as were found. The record was commenced and kept (in a loose and irregular manner,) solely for the writer's amusement, and at first designed to meet the eye of no other person—and the length of time that has since elapsed will suffice to prove that publication of these parts was not then designed. Upon looking over them recently, they appeared to contain nothing that ought to give offence to the individuals referred to, and the views, and even the mistakes of the writer, may attract the notice of others to points deserving more full and correct statements. Several of the more important parts of the notes were before published in the 1st and 2nd vols. of this journal, under the signature of "A Gleaner"—and if these remaining fragments are of no other use, they may suggest to readers who have better opportunities to travel, and to converse with farmers, how easy it would be for them to note down more important information, and to furnish to the Farmers' Register communications that would be far more interesting and valuable.]

Charles City, November 27th, 1836.

* * * * * None of the farmers, yet met with, use green clover in any way as food for working horses—and all consider its use would be extremely injurious to them. This certainly agrees with the opinions of my overseers, who have never permitted me to adhere long to even the partial use of green clover, though mown 24 hours before being used. They would insist that it weakened the horses, though their corn was not diminished, and they still had dry fodder once a day. I attributed their opposition to prejudice and ignorance: but here I find very intelligent and experienced farmers all concurring in the same opinion. Yet it is certain, as we see in English agricultural works, that green clover (aided by tares perhaps for a short time) is the long food of work horses as long as the mowing season lasts: and also that the amount of grain given is diminished considerably while clover is eaten. Can climate cause this great difference in practice? Or is our's altogether founded on mistake?

Mr. W—— T—— regularly harrows his corn field flush, (with a straight toothed square harrow, such as would cover seed wheat most effectually,) when the corn plants are high enough to want the first weeding (say 6 inches.) He finds no damage caused to the corn, and its tillage and cleaning much aided by the operation.

On the 28th, proceeded to Curles' Neck, (Henrico,) a peninsula of very uniform soil and character, bounded by James River, and two creeks, on three sides. It consists of several thousand acres of arable land, and is in seven or eight separate farms, formerly held by as many distinct proprietors. But, unfortunately for the improvement and value of the land, and for the public interests, 5 of these farms have been drawn into the gulf of a single rich man's estate. A perfect land-killing business now must be expected to follow—which was bad enough during the owner's life—but will be now worse, as the whole property (except its profits for a certain time,) is bequeathed to an infant, and for nearly 20 years this and all the other lands of this large estate must be butchered at the discretion of overseers.* The comfortable and handsome mansions are already going to destruction; and it would be useless to attempt to save them by repairs, as the owner can more cheaply suffer useless buildings to rot, than to preserve them. Our country presents every where the ruinous consequences of the division of farms, and the destruction of their value by being cut up into several pieces, no one of which is fit to live on: but here is equal destruction of value, in prospect, from the reverse operation—the accumulation of a number of fine farms in the possession of a single owner.

The soil of the whole peninsula, (or *neck*, which is our provincial name for such situations,) with some exceptions, is a mellow brown loam—a rich neutral soil, deep enough for ploughing of any power. It has generally, (since good farming was commenced here) been ploughed as deep as the team could effect, say 7, 8 or 9 inches—and the soil would permit still more. No doubt the original fertility of the soil was very great—but a long continued course of the common close cropping and grazing, and shallow ploughing, had reduced the soil to a low product, and mean appearance. Some enterprising proprietors began deep ploughing, and tried gypsum on clover; and found such remarkable benefit from all, that the land was rapidly and profitably improved. Now, though brought by bad management below its best state, this body of land is certainly the best that I have seen below the mountains, and of highland: and in situation and soil, may be considered as among the most valuable lands in the state. Yet the average sales of the several tracts last bought were not much higher than $20 the acre. I should suppose it well worth $40.

The rotation generally adopted here is as follows:

1. Wheat on clover lay, ploughed deep when broken, and again shallow before sowing.
2. Corn, for which the previous winter's manure is all used.
3. Wheat, on which clover is sowed.
4. Clover, not mowed, and but little grazed, and ploughed in August for the next crop of wheat.

This rotation agrees in general with that of Shirley, except the substitution here of corn for oats. Theory seems to approve the different mode of applying the manure, which is heaped and fermented as much as time allows, and carried out for the corn crop—thus having its benefit earlier than at Shirley, by one crop in the rotation. But I was told by Mr. M—— S——, (to whom I am indebted for most of the information obtained here,) that they would prefer keeping the manure for the wheat, but for the impossibility of providing labor to apply it during that very busy season. Very few cattle are kept, so that vegetable manure passed through the stables and barnyards, or ploughed in on the fields producing it, forms nearly the whole means for sustaining and improving the land under this apparently scourging rotation. Gypsum aids the growth of clover in a remarkable manner, and has been heretofore used generally, and perhaps every field has at some time had its aid. But here and elsewhere in lower Virginia, this manure is more rarely used now than formerly, which seems to make it doubtful whether the profit always more than repays the expense.

No lime has been used at Curles' Neck. A small experiment made with shell marl had good effects, as I was told; but I did not see the land, or the marl. This manure is found in the neighborhood, at Malvern Hills. The best land, forming the greater part of Curles', is certainly a neutral soil, and could derive no benefit from the neutralizing power of calcareous manures, which is their most valuable effect on worse soils: but no doubt the other properties of those manures would prove highly beneficial here, and on every other soil not already calcareous.

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* In this supposition the writer was mistaken. Curles' Neck has continued under the general charge of the gentleman who had temporarily assumed it just before the time of the above notes, and who is one of the joint owners of the income of the whole estate for a limited time, that has not yet expired: and to his sound knowledge, and skilful management as a farmer, is due the then unlooked-for result, that the downward course of the system of management has not only been stayed, for a time, but the previous good culture and improvement of soil restored as much as existing circumstances permitted.

Twice ploughing the clover lay, produces a better crop of wheat than once. This is also Mr. C——'s opinion: but he thinks the single ploughing which he adheres to, has more than compensating advantages in better securing the fertilizing power of the clover turned in. Certainly, sound theory seems to support this opinion; and the authority of Arthur Young, and the practice of good farmers in England, had taught me to expect from the single ploughing, a better succeeding crop, as well as more fertilization. Young denounces ploughing clover lays more than once, on any soil clean and light enough to prepare for wheat in that manner.

A singular practice has prevailed here to some extent. From so few cattle being kept, there is always a large surplus of coarse food and litter, the only use of which is to be converted to manure: and to aid this object, the farmers here often receive cattle from the neighboring poor lands, and support them free of charge through the winter. As a matter of mere economy, I doubt the propriety of this practice—as the food consumed by a cow would have been worth more as manure, than the excrement left from it, after supporting the animal with its nutritious parts.

Heard of no lime having been used as manure, between Shirley and Richmond, and only one small experiment with marl, at Curles'. I did not see the spot, nor the stratum from which the manure was taken. Saw a fine body of marl, (which I think is gypseous from appearances) at Evelynton, on the border of Herring Creek, in Charles City. No use has been, or will be made of it by the owner, who however is zealously engaged in hunting for and digging gold ore, in Spottsylvania. He will be a lucky miner if he derives as much profit from his gold, as he loses by neglecting the marl at his place of residence.

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York county.—The farm called King's Creek, on York river, and on the creek of the same name, is the finest and most beautiful body of land in this part of the country, under the most execrable management. It is 1800 acres: some back land high and poor—but the greater part, on and near the river, is a level sandy loam; deep, rich and neutral soil—part nearest the river bank highly calcareous, from the quantity of oyster shells which have been on the surface before the settlement of the country. We had no means of obtaining any accurate information as to products—and the miserable cultivation of the fields, and the close grazing, forbade our seeing the full worth of the land. This estate sold a few years ago, for $40,000, in 8 yearly payments, without interest. It then had a splendid dwelling home, which has since been burnt. *

* I should *guess* that this land (excluding the poorer half) would now make 25 bushels of corn, and 12 or 15 of wheat—and much more if put under a proper rotation, and decent management. It was supposed that if now sold, this place would command $25,000. At even $30,000 I should consider this estate very cheap, if it was not in the oyster country: but *there*, where every advantage of good and cheap living is found—good navigation and choice of markets—rich soils, or the best manures for improving poor ones—a curse seem to fall in every body, and scarcely a profitable farm, or thriving farmer, can be heard of.

Belfield, below, is another excellent farm, though inferior greatly to the last. This has 1000 acres, a dwelling house and farm houses of sufficient extent, and middling value, and sold for $8,000. The quality and appearance of the land very like King's Creek, though of less value and fertility. Here there is abundance of rich marl, which is used to very good purpose, though not very extensively as yet. The owner is Mr. R——— M———, a lawyer who resides in Williamsburg, and gives up the management of his land almost entirely to his overseer. Fortunately he has a good one, (from Charles City,) and this farm seemed to me the most profitable for the investment, not only in present returns, but in the system of improvement, and future prospects, of all that I viewed or heard of.

Porto Bello, the land of Mr. B——, and the two last mentioned estates, lie on the best waters of York river for obtaining the finest oysters. Vessels are always waiting (during the season, from September to May) for loads, to be carried to the north, and a number of boats are engaged every day in catching oysters for their supply. The great quantity opened for the inland market, on the adjacent landings, furnish lime that is now used largely to improve the lands; and the "oyster crackings" make a still better manure, which had accumulated in large quantity, but has latterly been all used. The crackings are the thin parts of the oyster shells, which are broken in opening them, and are small enough to be used without burning, and thus retain all the animal matter which fire destroys. Lime is also used by Mr. B——, and others between Porto Bello and Williamsburg—and to as much advantage as can be expected on the three-shift and grazing rotation. Saw marl on Mr. B.'s land so easy to apply, that it would be cheaper than burning lime, though the shells were already in heaps on the field. The marl certainly was poor and sandy, and therefore he had thought it not worth using: but it was so accessible, and well situated, that after once opening a pit properly, a mule could marl the first 30 acres in as many days. 100 to 120 bushels of slaked lime is considered here (as also among the good farmers on James River) a full dressing, for safety: but though that opinion is doubtless correct, as to *caustic lime*, still that quantity cannot give half the calcareous matter the soil usually requires, and that 400 bushels of good marl would give. The lime will therefore need renewal—and in comparing the cost of using marl and lime, perhaps the cost of the latter ought to be doubled, to be fairly opposed to marling.

Heard that R——— in Gloucester, the seat of the late G——— P—— is now offered for sale for $7000. It has 700 acres of very good land, and a building which has been the most costly, as well as largest private mansion in Virginia, but is now so much out of repair, that it would be cheaper to pull it down and build another house out of the materials.

* * * * *

In Williamsburg, which is half town, half country, much putrescent manure is collected from the streets, principally the pure dung of animals, for the use of the surrounding farms. This is generally "preserved" as it is supposed, or, as I consider, subjected to the greatest possible waste, by being heaped alone, and exposed to rain and sun, until wanted. Under these circumstances, decomposition, and the evolving of the gaseous products, must proceed continually and rapidly. The excrement from the Lunatic Hospital has for half a century been thrown into large pits, and never has been removed, except into the air by decomposition, and only was covered deep by earth, when the pits became a nuisance. If the rich marl, which is on the spot, were used to mix regularly with these excrementitious matters, they would never become offensive, and would be preserved as a body of the richest manure. If I lived near, I would give an annual rent of $50 for the use of this manure, which nobody will now meddle with.

* * * * *

Dr. M—— of Weyanoke has continued for 5 or 6, or perhaps more years to cultivate the same field in corn—but with peas planted between the rows of corn. Last year, about 250 bbls. from this field or (as his overseer thought) about one third of the whole, was found rotten when gathered. There seemed to be sufficient reason to believe that this was caused by corn being so long continued on the same ground. But I have heard of a much longer uninterrupted succession of corn, on either very rich land, or where there there was the worst and laziest farming—and no such evil was attributed to the plan. Indeed, I had thought that corn, different from all other grain, might be cultivated forever on the same land without diminution of product, provided the land was kept as rich as at first.

* * * * *

When passing through the light ridge land of James City, Mr. ———— pointed out a field which had been ploughed a number of years ago, in August, "as deep as two horses could break the land," and that so much injury had been sustained, that the field had never recovered. The soil was like the neighborhood in general, a poor silicious sand, on a similar white sub-soil, and not marled.

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PISE VERSUS MUD WALLS.

To the Editor of the Farmers' Register.

Columbia, S. C., July 30, 1836.

An article in the 3d No., 4th vol., page 172, signed "Philip St. George Cocke," seems something like a declaration of war against me; but as I am too old to fight with any prospect of victory, I must try the power of manifestoes and explanatory notes, which, I think, in nine cases in ten, a much better way than the carrying on war in the usual way. In the negociation for peace thus entered into, I must take heed lest the garrulity of old age exposes me again to *the reproach of writing too much.* Besides this reproach, which I consider unmerited for the reasons which I shall state in due time, Mr. Cocke adds to all he says, a spice of irony, which I am not conscious of deserving.

The reason that induced me to write at all on *pisé* for houses and fence walls, is, that I saw in your Register that many persons were at a loss how to supply the deficiency of wood for fencing. In the State in which I live, the use of the common rail worm-fence is a disgrace to an old, settled, and civilized country. I therefore thought I was doing good in showing that fences of a very superior kind could be made without incurring any great expense. In doing this, I thought it necessary to caution the readers of my article on pisé, against confounding it with what are usually called "mud walls," which I still think are very inferior to those made of pisé. *Hinc illæ lachrymæ.* I certainly knew not, at the time, that Mr. Cocke or any one else in Virginia had been constructing walls and houses of mud; and although I find now that his mode of constructing mud walls is very much like that of which I expressed disapprobation, it cannot be said that I attacked that gentleman in any degree at all. I had heard and read of the mud houses of the poorest people in Ireland, and had seen in this place three or four mud houses constructed by an English gentleman. On these specimens of the art, I founded my reprobation; for the houses did last but a few years, and as they had been a source of derision, it was most undoubtedly not improper in me to state that pisé work was very different, and superior in duration, and perhaps neatness of appearance.

Knowing full well how much of the preaching of religion and morality is practised before the desired effect is obtained, even in these two objects, on the goodness of which there is no dispute, it was not very culpable in me to have written as much as I did on the advantages of pisé structures, particularly as my first piece was not at all noticed. "But," says Mr. Cocke, "I think he has there in his zeal for pisé, opposed the influence of his name to the introduction of the more simple and humble, but not less useful system of mud walls," &c. This is a severe cut; for, so far from making any calculation on the influence or weight of my name, it must be very obvious that I quoted the authorities which I did, as well as the antiquity of this kind of construction, because I was well aware that my name could not avail much in persuading gentlemen to try this mode of building; and that it might, without these quotations, have been attributed solely to visionary and theoretical notions of mine. But let us not pluck the mote out of our neighbor's eye before we have taken the beam out of our own. And here Mr. Cocke uses the weight of his own most undoubted highly respectable name, to which he superadds four plantations, with a number of mud houses and walls, to which he, without mercy, adds Gen. Cocke, and the mud walls erected by him. This seems certainly enough to crush me to atoms; and notwithstanding all this superincumbent weight, I can stir a little yet.

So far from being revengeful, I will return good for evil, and heroically help my opponent with another arm against me. I have read many years since, but in what book, or of which of the many travellers in the east, I cannot now remember—but I certainly have read, that one of these travellers, on visiting the ruins of the Tower of Babel, found that it had been constructed chiefly of mud mixed with straw; and another states, that the straw was placed between the different strata of mud, much in the same way as Mr. Cocke describes the constructing of his walls. I do not vouch for the truth of these travellers' accounts, but only that I read them. Here, then, is an antiquity for the mud walls established beyond any other mode of building, in which Mr. Cocke has greatly the advantage over me and pisé structures.

Notwithstanding all this, I venture to question Mr. C.'s opinion, that his system of mud walls "is more simple and not less useful" than that of pisé work. I cannot see how any kind of construction can be more simple than that which is made with the earth merely as it is found after removing a surface of a few inches. There is neither water nor straw used in the pisé, whereas both are necessary in the mud structures: besides which, much labor must be used in the mixing and properly tempering of the materials. Now surely a piece of work, formed of one single material, used without any preparation whatever, but merely the putting of it into a sort of mould made of planks, and then beaten with pestles, is more simple than that which is compounded of earth, straw and water, which must be well wrought before the compound is applied to the intended structure. Yet I admit the possibility that the construction with mud thus prepared may not require more work than the pisé, the pounding of which is somewhat slow. As regards the comparative usefulness of the two, for durability must constitute a part of usefulness, I must claim the palm for the pisé. The other contains much vegetable matter, which must inevitably rot in time, when the walls must thereby be much weakened, and finally destroyed. The pisé being constructed of pure earth, clay and sand, or gravel, is incorruptible; and if well made at first, nothing but violence can destroy it. If, with my present experience, I had been the architect of the Tower of Babel, I should have had it constructed of pisé.

In conclusion, I most cordially, and in all sincerity, offer to Mr. Cocke, the hand of peace and friendship, and beg to be considered by him only as an humble fellow-laborer in the field of usefulness; and I am truly glad to learn that so much has been done towards substituting more durable materials for fencing and house-building, to the unsightly and inefficient ones hitherto in use.

N. HERBEMONT.

[We feel sure that Mr. Herbemont is mistaken as to the tone, and still more as to the *extent* of the censure of his opinions conveyed in the communication of Mr. Cocke: and if that assurance had not been felt, the expressions would certainly not have been admitted in this journal. We are confident that there was no irony meant in speaking of the weight of the name of Mr. Herbemont, and that Mr. C., in common with all who read the Farmers' Register, must feel respect for that name, even when opposing opinions sustained by it. Both of our correspondents are aware that all of us who are considered as "riders of hobbies," however useful we may be to the public, are sure to be more or less laughed at by all the world: and those who belong to that valuable and much slandered class, should not object to having a little added to the tax which they thus pay, by their being sometimes laughed at a little by each other. In this good humored warfare, our older friend has placed himself on equal ground at least; and it is hoped, that nothing nearer to personal controversy may be offered, in this or in any other case.]

LIME AND CLOVER IN MARYLAND.

To the Editor of the Farmers' Register.

Harford Co., Md., June 26th, 1836.

The farmers in this county are liming their lands to a considerable extent. The way in which it improves land, as explained in your essay on calcareous manures, is understood by very few in this section of the country. Until I read your essay, I used lime as I did my barn yard manure; and I believe the most of the persons who used it, have used it as I did, as I see the most of them take all off, and return nothing to the soil, except the very scanty allowance of their barn-yard manure; and the clover roots by those who sow clover, as they mow or pasture it close, and then plough for wheat. Indeed, some graze off close in the forepart of the season, plough in June, and re-plough in August and September, which I consider still worse, particularly for a light soil.

Still I am of the opinion. that lime is partially an alimentary manure for the most of crops, and particularly for clover, as I find it will vegetate and grow on my poorest old fields after they have had but a moderate dressing of lime, say fifty bushels per acre, which I consider enough for the first dressing on old worn out lands. Marked spots, where no corn nor rye scarcely grew the first and second years after liming, the clover looks as well, or nearly so, as on the rest of the field. And I find wheat to grow nearly, or quite as well, after turning in a crop of clover on similar places in other fields, as in any other part of the field; and thus, I conclude, that lime will make clover grow without the aid of putrescent manures, and will be of great benefit to wheat when combined with vegetable matter.

J. R.

MR. GOLDSWORTHY GURNEY'S SAFETY METHOD OF LIGHTING MINES.

(From the Evidence taken before the Committee of the House of Commons on Accidents in Mines.)

Has it ever occurred to you to consider whether mines might be lit under such circumstances as to do away with the necessity of the moveable lamp?

The subject has been one which I have lately considered a good deal, in consequence of being engaged again in experiments of a similar kind to those of 1822; I have recently made a series of experiments, for the Trinity House, on artificial light; and the results of these experiments, and observations connected with them, induce me to believe it possible to light coal mines without taking flame at all into mines. In a few words, I will state, that I think it capable of being done by reflected light. In these experiments I found artificial light may be produced, so intense that when placed in the focus of a parabolical reflector, it will throw a distinct shadow at the distance of eleven miles. Now, as light is capable of being concentrated, reflected, and refracted in any angles, or in any direction, or in any quantities, I think it possible that such light may be reflected into mines, subdivided, and passed through the galleries, in sufficient quantities and intensity as to enable miners to work far better than by lamps of any description. The light itself, and the combustion to produce it, could be placed above the shaft, in the open air. If, however, from mechanical difficulties, such as obstructing parts in the way of its passage down the shaft, it is possible that the light might be placed in some safe part of the mine itself, where fire-damp is never found, and from thence be reflected and refracted through the various parts of the mine. I have made experiments with this view, and have found light capable of being reflected, in various directions, with simple and inexpensive reflectors; the first reflection requires a true parabolic reflector, but afterwards plain and simple surfaces will do. Possibly, the whole mine and galleries may be all lit by a single light, if not very extensive; but if seven lights of the first order be placed in the focus of seven true 12 inch parabolas, and arranged within a circle of 3 feet diameter, which they may be, I firmly believe one of the longest mines might be most effectually lighted in every gallery. No one can judge of the power and management of this light who has not seen it, or possibly conceive its practicability to the subject before us. I need not go into explanation of the manner of doing it. The committee will remember that, as the angle of reflection is always equal to the angle of incidence, we may throw the light in whatever direction we please; by this means we may turn it round a corner at right angles, or in any angles suited to the drifts the mine happens to be cut into. The practical difficulties connected with this plan chiefly, I conceive, are those arising from obstructions in the galleries: one, for instance, is the air-doors, which are necessarily used for ventilation; there is no difficulty, however, in such case in placing a piece of plate-glass in some particular part of the door, so as to admit the passage of the light through it, or a second light may be brought in an opposite direction; again, if the galleries are so low that there is not room for the light, coal waggons or miners, to pass together, it is possible so to widen them, or enlarge them, that there would be a sufficient space for a sufficient quantity of light to pass; it may be passed through very small openings by strong concentration, and afterwards diverged as may be necessary.

Would it not be attended with great expense?—No.

Less than the ordinary mode?—I am not prepared to say exactly, but I think it would not be more expensive than the present mode. In case the light is not required to be very great, I think a light of less intensity might be used, with advantage, that would be less expensive than the present oil-lamps. A very simple but powerful light, is about to be adopted by the Trinity Board for light houses, which, by way of distinction, and in reference to the place where it was discovered, has been called the "Bude Light." This light produces an intensity 140 times that of the present Argand burner; this light, therefore, may be used where the ramifications of the mine, or greater extent, does not require the first order, namely, the lime light. In some cases, the light from the common Argand burner, placed in a parabolic reflector, may be sufficient, and in that case it certainly would be cheaper. I am of opinion, from the experiments and investigations made at the Trinity House, that the light from lime, and also the Bude Light, is less expensive than that of the ordinary light, taking quantity and intensity into account, which may be sub-divided to equal intensity with the first; the intensity of the one is 290 times greater than the other, and the intensity of the second 140; thus one is capable of giving the same quantity as 290 Argand burners, and the other as much as 140.

The term Bude Light has no application to the pecular manner in which it is produced?—It is a term simply used to distinguish it.

From what is it derived?—It is produced by striking nascent carbon, evolved in the combustion of oil, resin, or similar bodies, with oxygen gas.

You have spoken of difficulties in the introduction of this new system of lighting in the mines of this country; apply your mind for a moment to the difficulties which might arise in the mines not having above two or three feet depth of seam?—I think such difficulties are to be overcome by inexpensive boring or widening to admit the light to pass; in such a drift a stream of light, highly concentrated, of six inches diameter, would be ample, and whether it passed by the side or the top of the gallery, it matters not. A large quantity of light, by simple means, might be concentrated in such case, and passed along such an opening, and afterwards diverged in larger galleres, if such was indispensable. These are points upon which I think the committee willl find other persons more capable of giving information on than myself.

Supposing a light is required to be in a straight line for a mile, there would be no difficulty in obtaining a sufficient light at the terminus?—The light at the distance of a mile would enable you to read the smallest print. If it is reflected two or three times in that distance through a circuitous passage, you would lose very little, if you use good reflectors made of speculum metal. The quantity of light lost by such reflection is very trifling.

The question related to the casting of light upon one object at the distance named?—So I have answered it; it is of little consequence whether it be straight ahead, or at the end of a curved or angular gallery.

In case that light is then to be divided into fifty different directions, so as to suit different galleries, what would be the consequence as regards the terminus?—The result would be, that the light would simply be reduced fifty times in quantity; it would be divided into fifty portions; it would then be still stronger than the strongest Argand burners; and I beg to be understood as meaning the Argand burner used on the tables of private families, not the little oil burner of the safety-lamp. I will make an observation here which may be important, namely, the stream of light may be sent through the various galleries, and when it arrives at the situation where the men are working, every man, with a little reflector or refractor, as may be determined on, may take that portion of light which may be intended for him, and no more, from the great stream, and thus limit him the quantity of light that he may abstract from the stream; which portion he may at pleasure direct wherever he pleases on the work before him; so that instead of a lamp, he would work with a little diverging reflector, or refractor, which he would carry in his pocket, perhaps of the size of half-a-crown.

Do you not think that the experiments of scientific men might be better made in the mines themselves, than they could be in their own laboratory?—Certainly; if a principle is established, it rests as a matter of mechanical detail, or of mechanical situation and position, to know whether it can or cannot be applied, practically, with advantage. Sir George Capley informs me that he used the principle of reflection to throw daylight to some men who were working a deep well. It had a beautiful effect, and answered the purpose perfectly. His reflector was nothing more than a piece of tin plate. The daylight is not sufficiently intense; we cannot focus it so as to be passed through the galleries of mines.

In your opinion, would the experiment be better conducted by placing the light above the shaft, or at the bottom of the shaft?—It would depend on the depth and size of the shaft.

Assume 200 yards in depth?—In such case above; you get at the materials and apparatus for forming the light better; the distance of 200 yards has very little effect in diminishing the light; reflected light does not obey the same laws as radiated light; radiated light diminishes as the squares of the distances, but reflected light does not; this is contrary to received opinions, but I am satisfied it is correct, from the observations I have lately made.

You have not supposed any difficulties in the application of this light, beyond those already stated, which the committee understand to be the interruptions occasioned by stoppings or trap-doors in the mines, or the extreme sub-division of the reflected light?—I have: there are others, but I think of minor importance, which can only be justly appreciated in practice.

The shafts of the mines are placed at right angles, that is, they are driven along, and they begin at the further end, and then work upwards; is there any difficulty in transmitting the light at right angles?—Not any difficulty whatever; you may transmit the light in any angle you please; it may first be thrown down a shaft, and then sent into any angle, upwards or downwards, or on one side or on another.

Suppose there be a space of two or three feet left on one side, or on both sides, of the carriages conveying the minerals along the galleries, the light might be transmitted independently of the space occupied by the carriages?—Certainly.

Or through a similar space above the carriages?—Yes.

And you propose to obviate the difficulty of passing through the trap-doors, that means in the mines, by the insertion of glass in those doors; what is the smallest size you would consider sufficient for that purpose?—It would depend upon the situation in which the door was placed in the mine; if in the first gallery, where you wanted the full stream or supply of light to pass, you would require twenty inches diameter; when doors occur further on, in the division of light, perhaps, three or four inches in diameter would be sufficient.

Would that be sufficient to light a gallery at the distance beyond the door many hundred yards, if twelve feet wide?—Certainly. There is another valuable natural fact that I would mention here: the stream of light, as it passes through the air, is refracted by the atmosphere, and thrown in all directions several yards, with an intensity sufficient for practical purposes. My house at Bude has a long gallery in it; I passed a stream of reflected light through that gallery; every bed-room entering into the gallery was sufficiently illuminated in every part for a person to pick up a pin. The light in the bed-rooms was refracted light, from the reflected light passing through the gallery. I conceive that unless men are working at some distance from the stream of light through a gallery, a reflector would be scarcely necessary for them. Dust, floating in the atmosphere, reflects a good deal of light sideways.

Would the accumulation of dust upon glass so inserted in one of the trap-doors, be a serious impediment to the light?—Not practically, because it could be easily wiped away.

Are you aware that a boy is generally stationed to take charge of those doors?—Yes.

And of course, he might have instructions to keep the glass perfectly clean?—Certainly.

EXTRACTS FROM THE REPORT OF PROFESSOR DUCATEL'S SURVEY OF MARYLAND.

Geological Examination of Dorchester, Somerset, and Worcester Counties, on the Eastern Shore of Maryland.

These three counties, comprising more than one-third of the territory of Maryland, east of the Chesapeake bay, though presenting but little variety in their mineralogical and geological features, are yet not devoid of interest in these respects, while in others they offer subjects of consideration of the deepest importance to the prosperity of the state.

The most prominent geological feature in this district is a successon of sandy hillocks, in what are termed the upper portions of these counties, being a continuation of the ridge dividing the courses of the waters that empty themselves to the east into the bay of Delaware, and to the west into the Chesapeake. These hills of sand are themselves arranged in ridges, running generally north-east and south-west, diminishing in elevation towards the southern extremity of the peninsula, forming a curve on its eastern boundary, and presenting every appearence of a series of sandy beaches produced by successive retreats of an ocean. No organic remains of any kind are known to have been found within this portion of our territory, excepting a deposite of oyster shells at the head of Taylor's Creek, two miles above the fork of the Nanticoke, and ten miles below the fossiliferous deposite occurring on the north-west branch of this river, and previously referred to as the newer pliocene formation. This deposite is overlaid by soil six feet in depth. The shells contained in it are much in the same condition as those occurring in the accumulations supposed to have been made by the aboriginal inhabitants of the country; *i. e.* the valves are separated, and are not, so far as perceived, associated with any other marine shells. They are, however, perforated and covered with *serpulæ*, as if they had lain long, after the death of their inhabitants, at the bottom of the sea. But they are at a great distance from any actual oyster beds, and are in a more advanced state of disintegration than the fossil oysters heretofore observed; whilst, on the other hand, they are covered, as aforesaid, by a thick stratum of sand, no where else remarked to overlie Indian banks.

The lower portion of the peninsula lying in Maryland, embracing Dorchester, Somerset, and Worcester, is a low level country, mostly a deposite of stiff clay, excepting on the margin of the rivers and creeks, where the country is wavy and the soil sandy. The sand hills, on the borders of the rivers, are always situated on their south or south-eastern sides, and extend but a short distance inland. In some instances they form distinct ridges or waves of sand, running in various directions; sometimes parallel with the course of the river, and when occurring at the extremity of necks, transversely, or across the points. The intervening necks, sloping gently to the south and south-east, terminate in extensive marshes, which in high tides are frequently entirely submerged. In the midst of these marshes there are occasional sand hills, or hummocks; but rarely of any great extent.

The sameness in the geological constitution of the necks of land, just referred to, is evinced in the digging of wells, from which this section of country is exclusively supplied with water for domestic purposes. At a depth of from ten to twelve feet, penetrating through the stiff clay, there is invariably encountered a stratum of clean white sand, with gravel, varying from one to two or three feet in thickness. Out of this an abundant supply of good water can be obtained; but beneath it there is always found a soft black mud, with an offensive odor, and filled with decayed vegetable matter, composed principally of a coarse grass, similar to that growing upon the present marshes. In some places this mud is reported to be of great depth. It does not appear, however, to have ever been accurately sounded; but in one instance, already alluded to in a previous report, at Cambridge, it was traversed, and is stated to have been found overlaying a fossil deposite, the shells of which are referable to the older pliocene marls.

Another remarkable feature in the geology of this country is the occurrence of a ledge of water-worn stones, composed of quartz and sandstone, constituting gravel and boulders of various sizes, from twenty to several hundred pounds in weight. These stones were first observed between Todd's Point and at the head of Little Choptank; they were afterwards found scattered over a narrow zone of land, between Monie Creek and the Manokin. They are said to occur at the head of Back Creek, on the south side of Manokin, and were finally again observed near the mouth of Marumsco Creek, on Pocomoke Bay. At this last mentioned spot—being a knoll of dry ground in the marshes, protruding into the bay—the beach is covered with these stones, washed out of the bank. All of them are a close grained sandstone, with small veins of quartz, the sandstone being of the character of that occurring on the Blue Ridge, different from that constituting the *white rocks* at the mouth of the Patapsco, but similar to those larger masses that are found strewed over the surface in the upper parts of the Eastern Shore of Maryland, in Cecil county. These erratic masses form, with the exception of the bog iron ore—which will be presently more particularly referred to—the only stony bodies that occur in the three Eastern Shore counties, now under examination.*

Such are the great geological features of this section of country. A more detailed account of its physical geography will now be given under separate heads, for each of the three counties embraced within it.

Dorchester County, lying between the Choptank and Nanticoke rivers, requires perhaps more than any other county on the Eastern Shore, the assistance which would necessarily be afforded by an accurate topographical survey, in adopting measures to bring into operation her natural resources. Placed between two large rivers, her facilities for sending the produce of her soil to a market are yet not great, and mostly confined to the least productive part of her territory. The central portion of the county, most susceptible of great and permanent improvement, and even at this time the most productive, is deprived of an outlet for her agricultural staples, corn and wheat; and the no less valuable source of wealth, which she possesses, in her magnificent growth of timber. The natural channels of egress through the Blackwater and Transquaking have long since failed to be available in any thing more than a limited degree, these rivers serving now rather to increase the obstacles to the navigation of the bay into which they empty. Fishing Bay, their common estuary, offers scarcely more than five feet of water, at high tides, over a deep and extensive mud flat, which it is utterly impracticable to remove. The inconvenience arising from this cause is felt by a large portion of the county, and has suggested the application to the legislature, for the opening of a canal communication between the Blackwater and the Choptank. Such a canal would but partially remedy the inconvenience, whilst a more comprehensive view of the benefit to be derived, points to the practicability of connecting the Nanticoke with the Choptank. This is believed to be entirely practicable, and the advantages to be obtained from the connection of these two rivers, by means of a canal traversing the heads of navigation of the Blackwater, Transquaking and Chicamacomico—a project to be effected at a trifling expense—are great and obvious. A communication of this kind would not only furnish an outlet for the already valuable products of the county, but could be used as a means of conveying to it those materials, such as marl, lime, &c. (of which an abundance would be thus brought within a convenient reach,) that are necessary in order to enhance the productiveness of its soil, and bring it into that state of improvement of which it is susceptible. Other advantages may be expected to accrue from the excavation of a canal in the direction just referred to; among which, not the least important would be to render it subservient to the effectual and thorough drainage of a large extent of country, at present uncultivable, and not only itself insalubrious, but the main cause of the unhealthiness of that by which it is surrounded. It would seem to be at all times a subject worthy of the attention of a government that wishes to increase the quantity of nutriment, as well as to improve the salubrity of a country, and consequently to augment its population and prosperity, to employ suitable means to effect a complete drainage of every morassy district, within its dominion, of whatever extent. In the present case the proposed improvement forms, however, only part of a scheme of internal navigation that might, it is believed, be advantageously pursued for the benefit of a large portion of the Eastern Shore of Maryland.

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* A ledge of submarine rock is said to be off Todd's Point; and another to Benoni's Point, on the Talbot side of the Choptank.

In the upper part of Dorchester county the soil is mostly a sandy loam, well adapted, with proper management, to the growth of corn, rye, and oats. This character of soil belongs more especially to those portions lying on the rivers, and extends, with very few exceptions over a narrow slip of land on the Choptank, as far as Hill's Point, on the bay shore. The neck between the Big and Little Choptank is a low flat country, mostly composed of a stiff clay soil, covered with a plentiful growth of pine, sweet-gum, oak and dogwood, but suffering greatly from a want of convenient drainage; an evil that might be remedied, and by which thousands of acres of land, now of little value, would be reclaimed and rendered fit for cultivation. With the advantages possessed by this section of country, in her now extensive deposites of shells on the river banks, her sea-ooze, together with her proximity and easy access to the marl deposites of Talbot county, it ought to become one of the most productive and flourishing portions of the state.

The necks and islands, forming the western and south-western portions of the country, likewise present us with low and level lands and a stiff clay soil, mostly well timbered with pine, white, black, and willow oak, sweet-gum, &c. The situations on the islands are delightful and generally reputed healthy.

Meekin's Neck, on the bay shore, is marshy, and this is the case of nearly one half of Hooper's Island, the extent of which is nearly fourteen miles in length, and from one to two in breadth; such portions of the island as are arable have a productive soil. At the head of Honga river and bay, there are extensive meadows; and where the soil, also a clayey loam, is cultivated, it is said, to yield abundantly. Bishops-head Neck offers the same character of soil and physical aspect. Throughout the whole of this district the depth of wells is rarely found to exceed ten feet, penetrating the clay to sand, from which the water issues, seldom perfectly clear, and occasionally slightly brackish.

At the heads of Big and Little Blackwater Rivers there are also extensive marshes; the country is very level, low and swampy; the soil a stiff clay; timber principally oaks and sweet-gum. Between the Blackwater and Transquaking, around Buckstown, the country is more elevated, the soil lighter, with a growth of very large oaks and American poplars. The wells here are sunk to the depth of 12 feet, through clay, reaching gravel and sand.

Towards the head of the Transquaking, and between it and the Chicamacomico, the soil is a clay-loam, that would yield very good crops of grain, if properly improved. Beyond the Chicamacomico the country is more uneven, the soil lighter, sometimes sandy, the level of the country rising towards Vienna. Wherever the soil is stiff, it is covered by a heavy growth of oaks and gum.

Hurley's Neck, along the Nanticoke, south of Vienna, is a level stiff clay, well wooded, for the distance of about seven miles, after which it terminates in an extensive marsh.

No fossil deposites, similar to those occurring so abundantly north of the Choptank, have been discovered in Dorchester county, that would answer for agricultural purposes; but the large accumulations of shells found at Horn Point, at Oyster-shell Point, and other places, together with the deposite on Taylor's creek already referred to, might be made eminently serviceable if burnt into lime. The only mineral formations of any value are the deposites of bog-ore, at the heads of Transquaking and Chicamacomico, and on Reedy Creek, in the vicinity of Federalsburg. This ore is compact, heavy, free from phosphate of iron, and would probably yield from 40 to 50 per cent. of good metal. Some inclination having been manifested by an enterprising proprietor of an extensive deposite of ore, on the Chicamacomico, to work it in place, it was thought more advisable to recommend that it should be forwarded to the Baltimore market, where it would probably command from $3 to $4 a ton.

Somerset county presents, in its physical geography, as might have been expected, great features of resemblance with the county that has just been described. Its upper portions are very sandy and rolling—a succession in fact of sand hills, gently inclining to the south, and terminating in a level deposite of stiff clay—as if at one time this part of the country had been a sea beach, from which the waters have receded to a considerable distance beyond the mud flats that formed at the same period of time the shallow bottom of of the ocean, and extended several miles from her shores. But what is here supposed to have been formerly an extensive mud flat, is now a populous country, in many places well cultivated, every where very improvable, possessing a productive soil, well timbered, and intersected by numerous creeks and rivers. These form the *necks* of the county, falling by an imperceptible slope into marshes many miles in extent, with here and there a hummock, crowned with some lofty pines, or a herd of grazing cattle looming against the horizon, to relieve the monotony of the scenery. The waters of the sound, by which these marshes are limited, are not seen, unless perhaps from the top of some hummock, and are only indicated by the occasional passage of some skiff, whose white swollen sails contrast agreeably with the luxuriant dark-green growth of these grassy plains.

Without having reason to believe that the waters of the Chesapeake bay have absolutely diminished, it is nevertheless true that the amount of dry land is increasing on the Eastern Shore of Maryland, by the filling up of creeks, rivers, and small bays, at the confluence of its muddy streams. The flats of Fishing Bay and Pocomoke Bay furnish us with examples of this, upon a sufficiently large scale, to produce, in no great lapse of time, very remarkable changes in the geography of this part of our territory.

That portion of the neck of land lying between the Nanticoke and the Wicomico, and contiguous to the former river, is within a narrow stripe, wavy and sandy, inclining moderately to the S. E. and terminating in marshes. The intervening country is level, with a stiff clay soil; this being the character, as must already have been perceived, of all those portions of the Eastern Shore, comprised within what are termed the necks. Generally speaking, the N. and N. W. parts of these necks, extending along the rivers and creeks, have a light soil; in the central portions, the soil is clayey, and the S. and S. E. extremities are marshy; such is the character of Hungry Neck, between the Wicomico River and Monie Creek, and the description will answer for the Manokin Neck; though in this there does not appear to be the same uniformity in the character of the clay, which varies from a white and yellow stiff clay, to a black clayey loam, equally various in its degrees of productiveness and in the kinds of crops which it can be made profitably to yield. The upper parts of this neck are covered with magnifficent oaks, sweet gums, maples and beech; the lower portions support a growth of lofty pines, with an undergrowth of holly and sweet gum, and verging upon the marshes, that extend across the neck from the Wicomico to the Manokin, the pines are small, probably a new growth. The soil of the lands that terminate the neck—Big and Little Deele's Islands—on the north-west side, is a sandy loam, very productive in corn and sweet potatoes.

The aspect of the country between the Manokin and Annemessex, presents us with the usual almost dead level of clayey soil, covered partly with oaks, sweet gum, maple, &c. the pine predominating towards the lower end, and on approaching the marshes, the timber having been in a great measure destroyed, there remains but a scanty growth of small pines. The extensive marshes, called the Jericho marshes, form the extreme end of the necks, on the borders, and in the midst of which, are some few inhabited spots, more remarkable for their great salubrity, than, as might perhaps have been supposed, for the dreariness of their situations. To become convinced that health and comfort are sometimes found where they are very little expected, it is only necessary to pay a visit to the hospitable residence of Capt. Davy, at the head of the salt marshes of Jericho.

Annemessex Neck, whose soil and appearance would require the same description as that already given of similar portions of the country, is thickly settled towards the lower end, by a hardy population of boat-builders and boatmen; the latter supporting themselves principally by the sale of oysters, clams, and terrapins. These men may be instanced as further evidences of the healthiness of the marshy districts of country upon salt water. Whatever may be the influence of these marshes at a distance, judging from the appearance alone of those who inhabit them, or constantly frequent them, they are not the seats of disease; for it would be difficult, in any other section our country, to find a more hardy and robust set of men, than the residents on the Little Annemessex; and yet it is not to all that the praise of unexceptionable habits can be extended.

From the head of Little Annemessex, the eye looks over the broad expanse of salt marshes, reaching to the southern limits of our state—Watkin's Point being lost somewhere among them. Bounding these marshes to the north, there is a well wooded country, with a good soil and highly improvable, extending to the Pocomoke Bay and River, and comprising the district of Rehoboth. Marumsco Neck, towards the latter district, is also well wooded, the country level, and soil generally clay loam, in some places at the head of creeks more uneven and sandy.

Such is the account, and it will, it is believed, be found substantially correct, that may be given of the lowest portions of Somerset county. It has already been said, that the northern part of the country is sandy. It is especially so between Barren creek, and Salisbury; but from Barren creek, in the direction of Quantico, to Whitehaven, the soil passes from a sandy loam to the stiff clay bottoms, described as forming the principal soil of the necks. Along the Wicomico river, on either side, the soil is mostly sandy. On the eastern side of this river, and reaching from it towards the south, the soil varies from sandy, sandy loam to clay loam; and a northerly direction from Princess Anne to Salisbury leads successively over clay, clayey loam, sandy loam, and through a swampy district, to the sand ridges of the upper portion of the county.

The only mineral product of Somerset county is *bog-ore*, of which there is an abundant deposite, of excellent quality, at the head of Barren Creek. It has been raised in considerable quantity, and continues to be profitably extracted by Mr. Brattan, who delivers it at Baltimore for $3 the ton. A large supply of this ore might be obtained from this and other neighboring localities. It is also found at the heads of Back and Dividing Creeks; but samples examined from these places indicate an inferior quality of ore.

The mineral springs of Barren Creek deserve more attention than they have lately received. The waters have been analyzed, and were found to contain oxide of iron, soda, and magnesia, combined with muriatic acid. They belong therefore, to the class of alkaline chalybeates, are tonic and diuretic, and have been found eminently serviceable in bilious disorders. The well known curative properties of the waters, the comfortable accommodations at the springs, with the obliging disposition of the proprietor, and of the tenant, Mr. Levin L. Porter, ought to furnish strong inducements to invalids of the Eastern Shore of Maryland, to resort to them now, as they were wont to do in former times.

No fossil deposites, answering as marl, have been found in Somerset county; but a material almost as valuable occurs abundantly in various places, constituting those accumulations of oyster shells, believed to have been made on the site of ancient Indian settlements. The spots upon which these shells bank were observed, are, on the Nanticoke, at the mouth of Witipquin Creek, and at the Sandflea Landing; on the Wicomico, at Long Point, where there occurs one of the most extensive banks of the kind known, the shells therein, being deposited at the depth of from three to nine feet, extending nearly a quarter of a mile along the shore, and several hundred yards inland; on the Manokin, Maddox island and Fishing island are covered by similar accumulations; and on the Pocomoke, another occurs at Shelltown, about two miles above the mouth of the river. Banks of the same kind are found in other places, but of a more limited extent.

The value of this material has already been stated in a preceding report, but it cannot be too strongly impressed upon the farmers of the lower counties on the Eastern Shore of Maryland. *It is the principal agricultural resource which they possess, by a proper application of which they may double the produce of their lands.* In the upper counties of the Eastern Shore, where the worth of the material is appreciated, it is made to undergo two operations: it is passed through a coarse sieve, in order to separate the black highly fertilizing mould with which the shells are associated, and the fine fragments of these; the coarse clean shells are then burnt into lime. The sifted article readily commands from three to four cents a bushel: the lime sells at from six to nine cents, according to its quality. By referring to the section "On the comparitive value of shell lime and stone lime," your Excellency will perceive that the difference in value, between the two articles, for agricultural purposes, is very trifling, whilst the difference in price is considerable. Can any farmer doubt that the discovery, on the Eastern Shore, of limestone quarries even of moderate extent, and to be used solely for the conversion of the stone into lime, would be of immense benefit to the country? The equivalents of such quarries are found in the shell banks that have just been indicated. They should no longer be neglected.

Worcester county has long felt the want of some parental assistance, to enable her to bring fully into action her natural resources. She has asked for three capital improvements, of which two have been reported necessary and practicable; viz. the cleaning out of the Pocomoke river, so as to render it navigable for flat-boats, at least about fifteen miles above where it is now available, or seventeen miles beyond Snow-hill, at present the head of navigation; and a canal communication between Sinepuxent Bay and the Delaware. To understand the value of these improvements, it is necessary to possess an outline of the geography of the county.

This county is bordered on the east by the Atlantic Ocean; but between this ocean and the cultivable portions of the county there is a prolonged sandy beach, varying from a few hundred yards to a quarter of a mile and upwards in breadth, and extending the whole length of the coast without a single outlet to the sea from Indian river, in Delaware, to the southern extremity of Chincoteague island in Virginia. Between this beach and the main land lies Sinepuxent bay, from one to four or five miles wide, and nearly thirty miles in length. It is a shallow sheet of water, navigable only to a short distance above South Point, at the lower end of Sinepuxent Neck. The entrance to the bay is reputed to be also very shallow. Sinepuxent Neck, about ten miles long, lies between Assateague or Trap Creek and Sinepuxent Sound, at the head of the bay. The produce of this neck, and of country on the Assateague, which, comprising the Berlin district, are amongst the most flourishing portions of the county, has thus to be sent down a long bay through a difficult entrance, to encounter finally the dangers of an ocean navigation in search of a market, whilst an easy, short, and safe transportation could be readily obtained. To effect this latter object, it has been proposed to connect Trap creek by the St. Martin's and Indian Rivers, with the Delaware Bay, inside of Cape Henlopen. The surveys for this substantial improvement have been made, and its easy accomplishment, at a moderate expense, demonstated.

The other improvement, solicited by Worcester county—the clearing of the Pocomoke—has likewise been found to be practicable. Viewed in connection with the canal communication just referred to, it acquires more importance than is at first sight apparent. The Pocomoke river rises in an extensive swamp, situated partly in Maryland and partly in Delaware, called the Cypress Swamp, from the profuse growth of this valuable timber, by which it is covered. The bed of the river, now obstructed by large trees, lying across it in every direction, passes through the heart of the county, dividing it into two nearly equal portions. Owing to the obstacles presented by the fallen trees into its bed, its downward navigation commences only a few miles above Snowhill, after which it is free for schooners over a distance of about twenty miles, to the mouth of the river in Pocomoke Bay, on the Chesapeake side of the county. It has been proposed to remove these impedients as far up as the use of the river is found to be impeded by this cause; and the advantages to be thence derived are shown to be considerable.—It would facilitate the access to a vast body of valuable timber, and to extensive deposites of iron ore of good quality; and by confining the waters of the river within their natural channel, it would effect the drainage of a large tract of land, now an almost impenetrable swamp, covering doubtless a rich and fertile bottom. These are interesting considerations, whose importance becomes enhanced by the fact of the practicability of farther connecting, by a canal navigation, the head waters of the Pocomoke with the St. Martin River, and its projected communication with the Delaware, thus establishing a complete thoroughfare through the county, from one bay to the other.

But to render this project of internal navigation complete, another improvement seems to be required. The mud flat in Pocomoke Bay, already alluded to, forms, as is well known, a serious impediment to the free egress from the mouth of the river, through the sound into the Chesapeake, and the inquiry has been made as to the possibility of removing it. Attention having been turned to the subject, the removal was concluded to be quite impracticable, as well from its nature as from its extent; being the natural effect of causes, that, as *they* cannot be removed, would be constantly giving rise to the same results. Whatever remedy might be partially applied would be therefore but temporary, very expensive, and would do but imperfectly, what, it is considered, can be accomplished in a more permanent, less costly, and more efficient manner, in another direction, namely: by connecting the Pocomoke with the Annemessex,—a project which has already met with the approbation of the Legislature, and for the performance of which an adequate sum of money has been contingently appropriated.

As this project was brought forward by an honorable Delegate from Somerset, it shows that this county is equally interested in it, as she is in another direction with the proposed connection of the Nanticoke with the Choptank. Viewing these projects connectedly, it will be seen that they are intended to establish an internal communication of some extent, calculated to bring into full operation all the resources of the country through which it will pass, enabling it to send its products to a market by the shortest route, and facilitating to it the means of obtaining the materials necessary for its improvement. Some advantages would likewise be derived from it in case of war, upon which the belligerent spirit of the times compels us unfortunately to calculate as a possible event, by providing against the almost total non-intercourse between one section of the State and another. It forms a part of the duties of the undersigned to report to your Excellency, that the geological constitution of the country is highly favorable to the easy accomplishment of these projects.

The agriculture of Worcester is not in so favorable a condition as it might be brought to with a little more exertion. The soil is alternately sand and clay, or a mixture of both in variable proportions, and entirely deficient in calcareous matter. On the western side of the Pocomoke, the upper portions of this district that are not swampy, exhibit a succession of sandy knolls and ridges, with occasional basins, as it were, of level land, composed of stiff clay. The growth is principally pine and sweet gum; but on the branches, and in the swamps, there is seen a profusion of alder, maple, magnolia, kalmia, with the cypresses, of which two species were observed,—one deciduous, called the bald cypress, the other an evergreen. Between the Naseongo and Dividing creeks the soil varies from almost pure sand to a sandy loam, rarely, though sometimes clayey: the pine and sweet gum form the principal growth upon it. Along the margin of the river the soil is very sandy.

East of the Pocomoke the country is more swampy, the runs that feed the river being principally on this side. It is covered by a heavy growth of oak and cypress, and when cleared and drained shows a stiff clay soil. On some portions of the newly cleared land a young growth of papaw was observed, and in some places the less auspicious persimmon makes its appearance. Receding from the river the country is gently elevated, forming a low dividing ridge between the feeders of the Pocomoke and the waters of the St. Martin river and Sinepuxent bay. This ridge-land runs north and south, in the direction of the main road through St. Martins, Berlin, and Newark. Sinepuxent neck is a level tract of land, with a soil varying from sandy to clayey loam, occasionally passing to a stiff clay. The middle portion of the neck is tolerably well wooded; the extreme end, towards South Point, has been stripped of its timber. This, the Berlin vicinity, and the St. Martin district, are amongst the most flourishing parts of the county.

From Newark to Snowhill, on approaching the river and town, the soil becomes very sandy; and proceeding southwardly, as far as Newtown, the soil passes over a succession of sand hills, barely possessed of a soil. Towards the extreme end of the county, continuing along the Pocomoke, the country is more level, with a more substantial soil, said to yield good corn crops, and is much better wooded.

Crossing the peninsula in the direction of the dividing line between Maryland and Virginia, the country, at first level, soon appears gently undulatory, with a mixed soil, frequently a stiff clay ,to within two or three miles of the sea side, when it becomes decidedly hilly; occasionally well wooded with pine, oak, hickory, and dogwood, having a good loamy soil, that could be made very productive in corn and oats. This sea side, as it is called, is an uneven country, stretching along Sinepuxent Sound, descending to it occasionally by a gentle slope, and sometimes encroaching upon it in the shape of extended marshes. The ridge-land, between the sound and river, is more level, soil more clayey and equally improvable, but no where in a good state of cultivation.

Sinepuxent Bay or Sound, to which reference has so frequently been made, forms a very important feature in the physical geography of Worcester county. The map A. appended to this Report, and furnished for its illustration by the Topographical Engineer of the State, exhibits its actual appearance contrasted with that it bears in the maps and charts now extant. Its condition, as a navigable sheet of water, has been fully described in the "Report of the Commissioners of the States of Delaware, Maryland, and Virginia, for the survey of the sounds between Cape Charles and Cape Henlopen," submitted last year to the General Assembly of Maryland. For present purposes it is only necessary to consider it as a narrow and shallow sea, interspersed with broken marshes and shoals, composed of oyster shells, mixed with clam, scallop and other marine exuviæ. It is interesting in a geological respect, and not a little so, as will immediately be shown, for the agricultural resources which it actually does and can more extensively be made to yield.

It is an interesting fact connected with the past and present condition of Sinepuxent Sound, that since the closing up of some inlets admitting the ocean into it, its waters having thus become comparatively fresh, the oysters and clams, by which they were formerly thickly inhabited, have died, leaving extensive beds of their exuviæ. These accumulations of shells, or *oyster rocks*, as they are here termed, seem to point at the manner in which similar deposites, now far inland, and constituting the shell-marl deposites of other districts, have been made. They are evidently the quiet and gradual accumulation of years, covered by a deposition of sand or mud, varying, according to circumstances, with the altering condition of the country where they are now found, and in some measure serve to explain the mode of formation of our fossiliferous beds. At no very remote period of time, they will probably furnish the prototypes of a geological formation, hitherto undescribed and characterized by the presence of a new species of zoophytes. In their present state, these oyster rocks afford an abundant supply of a very valuable material, already put to good account, but that ought to be much more extensively employed. They are now dredged, and their contents, consisting of oyster shells, clams and other marine shells, incrusted by a zoophytic production which has received the name of *Bunyan*, are burnt into lime. From this source not only an important and profitable branch of industry is created, but an invaluable product obtained for the improvement of the whole of Worcester county. The question has been asked, whether the lime obtained from this source is good? It may at once be answered, that it is as good as from any other quarter; but a more satisfactory reply will perhaps be found in the third section of this report. Indian shell banks also are found on Sinepuxent Neck where they have been partially applied, and always with the best results, which ought to be an encouragement to their more liberal employment.

The mineral product of Worcester county is confined to the bog-ore, occurring abundantly on the Naseongo, where it has been worked with variable success, being unfortunately too much mixed with phosphate of iron. A deposite of ore of better quality has been discovered on the Pocomoke, in the fork between this river and Duncan's mill-branch, and it is again met with in the swamps around Newtown.

A more general view of the application that can be made of the knowledge so far acquired, respecting the physical geography of the three counties just described, remains now to be taken.

Agricultural resources of the lower counties on the Eastern Shore of Maryland

The agricultural improvements of Dorchester, Somerset, and Worcester counties, fall far short of what they might be made to attain, by a better system of cultivation, and a more liberal employment of the resources which this section of the state possesses. But to effect a thorough improvement, the attention should be first directed to the congeniality of the soil, in each district, for that species of growth from which a crop is expected. Corn and wheat are the staple commodities of the Eastern Shore, but in the present condition of things, the latter is so precarious a resource, that corn may be said to be the principal produce and main dependence of the lower counties. And yet their various soils are capable of producing a number of other crops: rye, oats, beans, potatoes, (common and sweet,) and the root crops generally. But it is not only in limiting the variety of their crops, that the agriculturists of this section of country err; they neglect to take into account the peculiar susceptibilities of the various kinds of soil, to produce certain crops in preference to others; and thus an injudicious system of husbandry is followed, resulting most frequently in disappointment. On some of the light soils described as belonging to the upper portions of these counties, wheat cannot be raised, whilst these same soils may be made to yield profitable returns of corn, rye, and oats; it is therefore worse than useless to attempt to raise wheat upon such lands. The opinion that oats exhaust the soil, is an unfounded prejudice; for any system of rotation, with proper management, appears to be beneficial. Those parts, on the other hand, that possess a clay soil, with variable proportions of sand, admit of the alternate extraction from them, of corn and wheat crops, provided they be followed up by clover, cut and turned in, with lime; or if grazed not too closely.

Another popular belief, founded upon prejudice, is, that plaster will not act upon lands contiguous to salt water. It is not so. Lands, whether near or remote from the sea, upon which *gypsum* did not seem to take kindly, have been found, *after being marled or limed*, to derive the usual benefits imparted by this valuable material.

In some parts of Somerset, a small portion it is true, as yet, the crop of sweet potatoes is the main one, and is found very profitable, as is evident by the thriving condition of the small farms on Big and Little Deele's Islands; whilst intelligent farmers, in other parts of the county, have turned their attention advantageously to the cultivation of beans, peas, &c. But there is yet another growth that bids fair to become of great value to the agricultural interest of the Eastern Shore of Maryland, namely, the *palma christi*, or castor bean plant, sometimes known by the name of *mole plant*.

An attempt was made in the Report of last year, to excite the interest of the farmers of Queen Anne and Caroline counties, in behalf of this new crop. It is to be regretted that they have not extensively, if at all, availed themselves of the suggestion—the bean having increased in value far beyond the most sanguine anticipations. There ought to be, therefore, no further delay to the introduction of this growth as one of the staple commodities of Maryland. Without having been as yet able to ascertain the precise cause of the extraordinary demand for this article, within a few years, there is still reason to believe that the call for it will continue to be great; since, notwithstanding its extended cultivation in consequence of the high prices obtained in preceding years, it now commands a higher price than at any other former period. It has been stated that the oil expressed from the beans is employed in large quantity in the manufactories of England for greasing the machinery by which these establishments are put into operation.

The culture of the palma christi presents no difficulties. It is said to thrive best in good corn lands, yielding, according to the quality of the soil, from twenty-five to forty bushels per acre. The land requires the same preparation as for corn; and the bean is planted like this grain,—in hills on which two or three plants are suffered to grow; the subsequent tillage being also the same as that practised for corn. The most tedious part of the management of this crop is the gathering of the fruit, which forms a cluster with a pyramidal termination; the lower portion being occupied by the male flowers that yield no seed, and the upper by the female flowers. In the female flowers, the ovary, which is roundish and three-sided, supports three linear reddish stigmas, forked at their apex. The fruit, properly speaking, is a round capsule, with three projecting sides, covered with rough spines, and divided into three cells, each containing one seed. The flowers appear in July, and the seed ripens throughout August and September. If suffered to do so on the plant, the capsule bursts with considerable force, projecting the seed at a distance, and scattering it about the field. To avoid this is the only extra attention required by this growth, and this is done by anticipating the maturity of the fruit. The directions are,—to visit the plantation a little before the commencement of the ripening season, removing those clusters that approach to maturity, (which is known by a change of color, from grayish green to a light pea green,) and conveying them to the drying ground, where, by the effect of the sun's heat, they burst, and dislodge their seeds. The only preparation for the drying ground is to provide a small place, cleaned and levelled as for a threshing floor, upon which the clusters are scattered. It would be advisable to locate this spot in the neighborhood of the barn, or near a shed, so as to facilitate the removal of the plants, in case of protracted wet weather, to some sheltered situation. Transient showers of rain do not, however, damage it, otherwise than by blackening the seed, whereby its sale might be injured, although it does not diminish its productiveness in oil. The occupation of gathering having once commenced, it should be so arranged as to visit each plant twice a week, morning and evening, until the whole crop has been secured. It may then be sent to a market, where, at the time of writing this Report, it commands three dollars a bushel; or, it may be made to yield its oil by the following process, as practised in Northampton county, Virginia.

The seeds are first to be thoroughly cleaned of dust, and of portions of the capsules that may have adhered to them. They are then introduced into shallow iron drawers, arranged on both sides of a furnace, where they are exposed to a gentle heat; the object of this first operation being to render the oil more easy of expression. From these drawers they are conveyed into a powerful screw-press, by the operation of which the oil is obtained. So far, however, the oil is impure: It must now, therefore, be transferred to clean iron boilers, previously supplied with water. As the boiling proceeds, the impurities that rise to the surface are skimmed off, and the clear purified oil finally makes its appearance, floating on the water. It is now carefully removed, and a second time subjected to the boiling process, with a very small quantity of water, until the latter liquid has been entirely dissipated. This is ascertained by taking out a small portion into a vial, and observing whether it preserves its transparency as it cools. Some care is required not to push the heat too far, as then the oil would acquire a brownish hue and a hot peppery taste, which would at all events unfit it for use as a medicine. One bushel of seeds yields about one gallon and three-quarters of oil, at an expense of about 25 cents a bushel, which is refunded by the sale of the *pumice*, found to be an excellent manure for corn crops. Acknowledgments are due to Mr. Smith, of Northampton county, Va. an intelligent and experienced planter of palma christi, and manufacturer of castor oil, in the vicinity of Eastville, for the information contained in the above paragraphs.

It is needless, after what has just been said, to expatiate upon the value of this plant. That the soil and climate of at least the lower portions of the Eastern Shore of Maryland are congenial to its growth, cannot be doubted. The praiseworthy example (crowned, it is believed, with entire success) has already been set to the inhabitants of Somerset, by one of the most intelligent farmers of the county—Col. Arnold E. Jones.

Persons well acquainted with the cultivation of rice confidently assert and believe, that there are many spots on the Eastern Shore of Maryland, well calculated to the production of this important agricultural commodity. Rice has been raised in Maryland, in the vicinity of Salisbury, at the head of the Wicomico, and a promising attempt, the result of which has not been ascertained, was recently being made opposite Vienna, on the Nanticoke. It would seem desirable to encourage such attempts, as further conducive to the practical illustration of the possibility of reclaiming a vast body of lands at present of little value. These are the marshes and cripples that occur on the margin of the large rivers on the Eastern Shore of Maryland. An examination of the actual condition of these marshes justifies the belief that they might, to a certain extent, be drained; whether sufficiently to be made permanently arable, or only to the extent of serving as more firm and safe pasturages, remains to be tried. It is thought that the single operation, though one not unattended with difficulties, of diverting a part of the course of the river so as to cause it to pass between the marsh and the mainland, would greatly contribute to their drainage. This appears from the fact, that their most elevated parts are those contiguous to the river, inclining moderately towards the firm land, adjoining which the marsh is always found to be the softest, and more liable to a total submersion. By insulating these bodies of land, always more or less miry, and thus establishing a drainage around them, it is possible they might eventually acquire sufficient consistence, without having recourse to embankments, to afford safe and valuable pasture grounds. The cripples seem irreclaimable by any other means than by embankments,—an operation deemed practicable by those who have given much attention to the subject, and who represent them as best fitted for the cultivation of rice.

Such are the agricultural resources of the lower counties on the Eastern Shore of Maryland, so far as the productiveness of the soil, and its susceptibility of improvement are concerned. It has already been stated, that the only incidental resource possessed by this section of country, is to be derived from the facilities of obtaining calcareous matter (in which the soil is essentially deficient) from the shell banks, oyster banks, and other sources already referred to. But before any hope can be indulged, that the inhabitants of this portion of the state will avail themselves of these means of bringing their lands into a higher state of cultivation than they seem to have any idea that they are capable of, it is necessary to remove a fatal impression, too generally made, that the lime derived from shells is of but little value. The result of the inquiries made to disprove this opinion, will be given in the next section of this Report.

An error equally fatal prevails among the citizens of Maryland, in reference to the counties that have just been passed in review—that they are as devoid of the interest as they have been believed to be of resources. It is hoped that the minute, and, at the same time, faithful account given of them—more minute than would otherwise have seemed necessary—will have a tendency to rectify the false judgment so commonly passed upon this portion of our territory and contribute likewise to cheer those of its inhabitants who have become disheartened at the present aspect of things, and who are too prone to believe that their industry could be better rewarded at a distance. Industry meets with its just reward every where; but the assertion is safely ventured, that the same amount of enterprise at home, would secure more comfort and happiness, than, under any circumstances, can be expected in a newly settled country, where all that is obtained is at the cost of solid enjoyments. The adventurous merchant and speculator may find a wide field in the "Far West" to satiate, if possible, his thirst for wealth; but the industrious farmer, on the tide waters of the Chesapeake needs no better patrimony than that which he already possesses. A soil easily cultivated, and very improvable, having the means of improvement at hand; the necessaries, and even luxuries of life in abundance; a temperate and healthful climate; a free and constant intercourse with a large commercial emporium, by means of a water communication reaching to the very door of his granaries; surrounded moreover by intelligent neighbors, and a peaceful and orderly population—such are the advantages of which he can boast, as a set-off against those of any other section of our country. It is full time that he should learn to appreciate them himself.

REMARKS ON PROFESSOR DUCATEL'S GEOLOGICAL SURVEY OF THE EASTERN SHORE OF MARYLAND.

To the Editor of the Farmers' Register.

Eastern Shore, Maryland,
12th July, 1836.

The improvement of our condition, has become a matter of very serious import, to the farmers of the Eastern Shore. Many of us are much disheartened, and we have received no great encouragement from the reports of our geologist, Professor Ducatel. If he be right, that the lands we have heretofore considered the most valuable, "are best adapted to the growth of Indian corn," perhaps emigration to the fertile regions of the *far west* is our best plan, though at the hazard of being taken for abolitionists and gamblers, as we descend the river, and falling within the jurisdiction of Judge Lynch, a gentleman whose acquaintance we do not at all desire to cultivate. Men who exercise their minds in deep research and profound enquiry, rarely attend much to the common interests and concerns of life. The Canon Recupero passed much of his life on Mount Etna, and had formed some subtle theories as to its age and formation; but its capacity and suitableness for production, perhaps never entered into the range of his speculations. Professor Ducatel's inquiries were too much directed to the bowels of the earth, to pay much attention to the surface—minerals and marl seem to have been his ruling fancy. A little attention and a little instruction, of which he was entirely in the way, would have taught him that much of the soil which stands condemned by him as unsuitable to the growth of wheat, "and particularly adapted to Indian corn," consists of a fine chocolate colored loam, with a red clay bottom, and when under proper improvement and in a good state of cultivation, is equally adapted to wheat and Indian corn. The station of a geologist appointed by the State, is one of high confidence; his opinions of the character and capabilities of our country, abroad, hold an official weight, and ought to have been formed by his own observation, or the information of men in whom reliance could have been placed. This would have saved him from the propagation of the error, that our stiff white clay lands are the most valuable. The Professor would have found on the Eastern Shore, a concurrence of opinion, that they are not naturally fertile, but prone to the production of what is called here, poverty grass. If lands of this description be well ditched and highly manured, in a favorable season, they will produce a heavy crop of wheat; but they are not kind to the growth of valuable grasses, which, in all farming countries, is the life of agriculture. The late Col. Edward Lloyd of Talbot, whose memory is dear to his friends for qualities much higher than "his elegant hospitality," held a large estate in Miles River neck—it is bounded on one side by Wye River. Chew's Island is directly opposite, and the land on the river fields of the late colonel's estate, correspond with the soil of Chew's Island. In the middle of the neck, there is a large portion of clayey lands, white, stiff, and tenacious: these lands he brought to a high state of product by lime and other manures, and extensive and laborious ditching; but he always esteemed his lands on the river the most valuable, both for wheat and Indian corn. William Strickland, an English gentleman, (and I suspect a scientific agriculturist,) intending, in the year 1796, to visit the United States, received from the British Board of Agriculture certain queries, which he answered on his return. He relates, that for one-half of Chew's Island, £7 14s. per acre had been offered, and refused; and, at that period, he states, the piece of land on the Monocacy, in Frederick county, now one of the most valuable districts in Maryland, at £4 14s. Yet Professor Ducatel esteems the lands on Chew's Island, and those of the same quality on the Eastern Shore, as those best adapted to the growth of Indian corn. When the Professor shall have mixed a little more agriculture with his chemistry, he will change his opinion. Chew's Island, and many other lands of the same quality, had been greatly exhausted by neglect and imprudent agriculture; but they are indigenous to white clover, and they are capable of producing red abundantly with the application of gypsum; and by the addition of marl, they can, in a few years, be brought into a state of great fertility. On this subject, I speak from experience.

We have certainly many barren lands on the Eastern Shore, some of them sandy in the extreme; but for the extent of country, not greater than the steril hills and mountains of Lancaster, York, Cumberland, and Franklin counties, in Pennsylvania. Those of Caroline, on the east side of the Choptank, are perhaps among the worst. Yet Professor Ducatel found them "astonishingly productive of Indian corn." He had the rashness to recommend the introduction of palma christi; had the good people abandoned corn, and taken to palma christi, and the crop had succeeded, it would have deluged Baltimore in castor oil; had it failed, they might, with good cause, have regretted that Maryland had appointed a geologist, fresh from the city; and some sufferer, smarting under his loss, might have applied "empirical" to the scheme, a term equally odious to doctors and philosophers, and which none but an angry, or disappointed man, would ever extend to Professor Ducatel. Though I combat some of his opinions, I do it in the spirit of kindness: so far from detracting from his merits, I avail myself of this opportunity to proclaim them. When he first appeared among us, and we were told he was our geologist, and had come to discover the hidden treasures of our country, it produced that shyness and diffidence which the unlearned always feel for the wise; but his good manners and courteous address soon put us at ease. He talked the language of the country, not of the schools, and was communicative, familiar, and a little complimentary: he made some valuable discoveries, and excited a spirit of inquiry which has led to many more; and I speak the language of sincerity, not compliment, when I say the Eastern Shore of Maryland has derived solid benefits from the labors of Professor Ducatel.

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STEAM PLOUGH.

Some experiments were tried on Friday week at Red Moss, near Bolton, in the presence of Mr.

Handley, M. P. for Lincolnshire; Mr. Chapman, M. P. for Westminster; Mr. Smith of Deanston, and other members interested in agriculture, with a complete and very powerful steam plough, constructed by Mr. Heathcote, M. P. for Tiverton. About six acres of raw moss were turned up in a most extraordinary style, sods eighteen inches in breadth and nine inches in thickness being cut from the furrow, and completely reversed in position, the upper surface of the sod being placed exactly where the surface had been before. The possibility of ploughing by steam has thus been established, though, as the employment of the steam-plough, in preference to one drawn by horses, will depend on the comparative cost of the two powers, and on that of the two implements used, and as there are not at present any sufficient data for judging what the difference of the cost will be, it is not possible to say how far steam is likely to be applied to this department of agriculture. The plough of Mr. Heathcote, though a very powerful machine, appears to us to be much too complex and costly for common agricultural purposes, though we have little doubt that it might be used not only with effect, but advantage, in reclaiming large portions of moss land—such as the bogs of Ireland. Indeed, it is the opinion of Mr. Heathcote himself, that it would not at present answer to employ it in reclaiming a smaller portion of bog than 1500 or 2000 acres, though it may probably be cheapened and simplified, so as to make it ultimately useful on a smaller scale.

[*English Paper.*

From the Silk Culturist.

AGRICULTURAL JURISPRUDENCE.

At the late term of the Supreme Court of Errors, in this city, a question of agricultural jurisprudence was settled, which has often been the occasion of much controversy, and sometimes of a total interruption of that social intercourse and interchange of kind feelings and offices, without which neighborhood ceases to be a blessing, and actually becomes a curse. The question arose in an action of trespass for taking a portion of the fruit from a pear tree. The facts in the case were these. The trunk of the tree stood about four feet from the divisional line between the plaintiff and the defendant, and its roots and branches extended some distance into and over the defendant's land. The defendant plucked the fruit from the branches overhanging his land, to within about one foot of the line, for which the action was brought.

The defendant claimed, first, that he was tenant in common with the plaintiff, in the tree, and consequently had a right to take from the branches on his side of the line. Second, that if he was not tenant in common with the plaintiff, he was owner in severalty in that part of the tree which drew its nourishment from his soil, and that he had a right to take the fruit from the branches that overhung his land. Third, that if he was not owner of that part of the tree which is sustained by and overhangs his land, still he was entitled to the fruit growing on such branches. Fourth, that he had a legal right to remove the overhanging branches and projecting roots, they being a nuisance which he had a right to abate.

The court ruled the first three points against the defendant, and decided that the ownership of the tree was in the proprietor on whose land it was originally planted, and that he, of course, was entitled to all the fruit, though the roots and branches may have extended into and over the land of the adjoining proprietor. On the last point the court decided that the projecting roots and branches were a nuisance which the defendant might have abated; but had no right to appropriate to his own use.

From the New England Farmer.

TARRING FRUIT TREES INJURIOUS.

I would state a fact, showing, as I suppose the effect of *tar* upon fruit trees. My neighbor and I owned two adjoining orchards: the canker worms have visited them without mercy for eight successive years—my neighbor tarred his trees in the usual way, mine were many of them large, and taking into the account the expense and trouble and chance of injury from the tar itself—I suffered the insidious invaders to range unmolested. The last season the worms were few compared with preceding years, and many trees were permitted to produce as they were wont. My neighbor's trees abreast of mine, of the same age and kind, bore but sparingly, while mine produced in great abundance—the tar must have been the cause. This matter is, no doubt, well understood, but as it came under my own eye, I pass it to you: it may not be useful to publish.

Yours, truly,

JOSEPH HARRINGTON.

From Poeppig's Travels.

BREEDING OF CATTLE IN CHILI.

The breeding of cattle is, for two reasons, the branch of rural economy which is preferred by the Chilian to every other; in the first place it gratifies an inclination for wild and independent life, and his love of every thing that is adventurous and bold, and requires violent, not uniform, exertions. The best educated men of the larger towns, on an occasional visit to the country, take pleasure in pursuing the cattle, and participating in the occupation in which the mountain herdsman (vaquero) is engaged. * * * The Chilian, especially of the lower class, possesses a wild energy of character, which was misunderstood by the former government, or at least not duly employed, and which inclines him to such occupations as disqualify him and probably will do for a long time to come, for a uniform and sedentary employment. A second perhaps still more important reason is, that, since the expulsion of the Spaniards, and the introduction of a free system of trade, the breeding of cattle has proved more profitable than agriculture. * * * The number of animals which a single land owner possesses, would often appear extravagant to a European ear. They speak with great indifference of herds of 1000 or 1500, and consider a man by no means rich who has three times that number. The haciendas in the central provinces often have from 10,000 to 15,000, and many even 20,000, and the number of smaller estates which have from 4 to 5000 is very great. Since the revolution, the value of this species of property has risen in an extraordinary degree; and the owners are very far from doing as they did in former times, killing the animal for the sake of his hide, and leaving the flesh to be devoured by the condors. * * * This branch of Chilian economy is however not without risks, which are not indeed frequent, but cause astonishing destruction. In the years 1829 to 1832, a vast number of cattle perished in consequence of an unexampled drought, which extended over all the provinces of Central and Northern Chili. It appears from an official statement, that in the year 1831 alone, 515,326 head of cattle died of hunger in the provinces of Coquimbo and Copiopo; of these about 77,000 were horned cattle, 10,000 horses, 23,000 sheep, 211,000 goats, &c. Though the number may be rather exaggerated, because the landowners wished to make their loss appear as considerable as possible, still the injury was very great.

From the New England Farmer.

RAISING CHICKENS.

Mr. Fessenden,

Sir—In one of your late papers I saw mentioned a successful way of *raising chickens*. I have been in the habit of raising them for some years, and if you think favorably of the mode I have adopted, you can insert it in your valuable paper.

I keep my hens warm under cover during the winter, and feed them on "Brewers' Grains" placed in an open box or tub, that they may eat when they please ,occasionally giving them oats, corn, and oyster shells pounded fine, and plenty of water. By keeping them warm and well fed, they begin laying earlier in the season. I prefer spring chickens, as they lay earlier than old hens—and the old hens to set, as they make the best mothers. I take care the eggs do not get chilled with cold, and keep them in a warm place in my house. When three or four hens want to set, I put from thirteen to fifteen eggs under each of them, according to size—the day of the month marked on each egg—and after the hen has set a week or ten days I examine them by holding the eggs to a crack or knot hole in a board when the sun shines through, and if I discover any rotten ones, I take them away and replace them with fresh ones marked as before mentioned. When the chickens are all hatched, I put two or three of the broods to one hen, in a coop with an opening against an empty barrel placed on the bilge, and with a little care, when put in the coop, the hen may be made to brood them at the further end of the barrel. In that way the chickens that are not covered by the hen huddle together around her, and keep each other warm. The hens from which the chickens are taken I put into another coop, and in about a fortnight they will begin to lay again. The hen being confined in the coop, will leave her chickens much earlier than if left to run at large with them, and the chickens will become so accustomed to going into the barrel and huddling together, as to be quite contented to give up the hen's brooding them. After the chickens are two or three weeks old I remove them with the coops into my garden, where they feed upon insects, so as to require but little food—but do not keep them there until they are large enough to injure the garden.

I feel persuaded that in the way I have proceeded, our market could be supplied with an abundance of poultry, and I recommend it with confidence, if managed with care and attention, as profitable to those who may engage in such business.

Charlestown, July, 1836.

From the Advocate of Science.

PRACTICAL USES OF GEOLOGY.

So far from being that abstract and speculative science which those who are ignorant of it often suppose it to be, geology is full of useful application to the common pursuits of life. The agriculturist, the miner, the architect—every employment that has a direct relation to the materials of our globe, derives advantage from geological knowledge. It cannot be otherwise, when geology involves an acquaintance with all the substances which enter into the composition of the accessible portions of the earth.

But the most striking and the most beautiful application of this science to useful practical purposes, depends on the principles of stratification hereafter to be explained. For the present I will only remark, that the superficial portion of our planet is found to be stratified, or composed of distinct strata of various materials; and that these strata are proved to occupy a uniform position relative to each other.

Mineral salt occurs in one of these strata associated with gypsum or plaster of Paris. Where one of these valuable minerals is found, the presence of the other may therefore be suspected. But the stratum containing them is superior in its situation to crystallized limestone, to slate and to granite. It follows, that wherever the exposed surface of the earth consists of either of those rocks, gypsum and rock salt do not exist; and a search for them would therefore be fruitless. In searching for coal and other mineral productions, similar principles are called into application, and prove a valuable aid to the miner. For want of the knowledge of a few of these elementary principles of geology, much time and labor and money have been wasted in attempting to discover substances of value in situations where they could not exist.

Extracts from the Journal of the Franklin Institute.

LIST OF PATENTS ISSUED IN DECEMBER, 1835, FOR IMPROVEMENTS OF MACHINES, &C. TO BE USED IN AGRICULTURE.

With remarks, by the Editor of the Journal of the Franklin Institute

For a *Machine for Hulling Clover and other Seeds;* George W. Taylor, Bridgeton, Cumberland county, New Jersey, December 4.

The rubbing is to be effected by revolving, cast-iron disks, the surface of which are convex, so that they are in shape like a double convex lens; the surfaces having grooves formed upon them, and which revolve between cast iron cheeks furrowed in like manner, and embrace about two-thirds of the disks, the other third being cut away to allow of the necessary space for the feeding and delivery of the seed. There is to be a feeding hopper above the revolving disks, and other necessary appendages. The claim is to the machine as described.

For a *Machine for Cutting Straw, and Thrashing and Winnowing Grain;* Leonard Marsh, Hartford, Windsor county, Vermont, December 9.

This is a combined machine intended, in general, to cut the straw into lengths, like an ordinary straw cutter, and to thrash the grain from it, after which the grain and straw are to be separated by winnowing, in the usual way. When the grain is to be thrashed only, the cutting knives are to be removed, the thrashing part remaining, to effect that object.

For an improvement in the *Machine for Pressing and delivering Bricks;* Ulysses Ward, Washington city, December 15.

This patent is obtained for an improvement upon the brick machine patented by Nathan Sawyer, on the 8th April, 1835, which it is proposed to simplify by dispensing with the combination of wheels for conveying the power to the press, and by certain alterations in the apparatus by which the pressed brick is delivered. These alterations, or improvements, could not be clearly described without the drawings; we are informed that the improvements, are really such, as they have been carried into operation, fairly tested and compared with the original machine.

For a *Machine for Cutting or Splitting Laths;* Barnabus Langton, Troy, New York, December 15.

A horizontal bench, or frame, is to be made, which may be sixteen feet long and seven wide; and at each end of this there is to be a head-block, against which the laths are to be cut. The cutting is to be made from the edges of boards, sawed of a proper length, there being two cutting knives at each end of the frame. These cutting knives meet in the middle of the board, as the lath is cut, their outer ends working on pins attached to the head-block or frame, and their inner ends on similar pins connected with a sliding bar extending along the middle, and from one end of the frame to the other. The sliding bar is worked backward and forward, horizontally, by a crank motion, so that when the knives at one end are cutting a lath, those at the other are being withdrawn to allow the board to descend for a new cut. The pieces of board are passed into a slot, edgewise, at either end of the frame, and descend by their own gravity, or to a gauge which determines the thickness of the lath. It is proposed sometimes to use a single knife at each end, which knife must in that case, be the whole length of the lath.

The claim made "in the above described machine, is the machine itself, and the manner of cutting lath above specified and described."

Such a claim, we apprehend, must be understood to include not only the combination, but also, the several parts as described; in which case it is much too broad, as the cutting of laths from the edges of boards, fed to the knife in a similar way, is not new. In some instances the knives used have formed a very obtuse angle in the middle, so as to cut first at the two ends, and this plan we think much preferable to the jointed knife which is at every instant altering its cutting angle. Still, should the machine before us be preferred, we think that enough of novelty might be pointed out upon which to found a valid claim.

For a *Tobacco Press;* John W. Weems, West River, Anne Arundel county, Maryland, December 15.

There is not the slightest novelty in this press, although such a one may not have been used for pressing tobacco. The piston, or driver, placed horizontally, is a rack into which a pinion works, this pinion being on the shaft of a cog wheel, turned by a pinion on the shaft of a drum, or hand wheel. The hogshead into which the tobacco is to be pressed is rolled on to the frame, or ground sills of the press, one end resting against a head block, and the follower being brought up against the tobacco contained in it.

The claim is to "the before described press, for pressing tobacco and other substances."

For a *Machine for Cleaning Buckwheat;* Daniel T. Laning, Bridgeton, Cumberland county New Jersey, December 15.

A stationary hollow cylinder is to be made and fixed on a suitable frame, its periphery being in part formed of boards, and in part of woven wire. An axis passing through the centre of this cylinder carries four wings made of plank, which are caused to revolve by means of a whirl placed on the end of the shaft, thereby agitating the buckwheat which is put into the cylinder, and throwing it against the woven wire, through the meshes of which the foreign matter escapes. The claim is to "the said machine,"

For a *Thrashing Machine;* Moses Davenport, Philips, Somerset county, Maine, December 28.

The general mode of thrashing by a cylinder and concave, is employed in this machine, the concave being placed above the cylinder. The claims made are to a feeding roller with teeth, which takes the unthrashed grain from a feeding apron, and aids in conducting it to the cylinder, and to what is called a separater, which allows the grain to pass through to riddles and fans, whilst the straw is carried off. There is nothing in this machine that requires particular notice.

For a *Brick Machine;* Benjamin Hamblett, Portland, Cumberland county, Maine December 28.

The clay is to be mixed in a box by revolving arms or knives, in the manner well known, and from the lower end of this it is to pass out through an opening to be moulded and struck. The apparatus is described at great length, and there are several distinct claims; the machine so nearly resembles some of its predecessors that any attempt at description and comparison, would demand much room, and consume more time than we have to spare. The claims alone would not furnish a correct idea of the things claimed,

For a *Thrashing Machine;* Amos Hanson, Windham, Cumberland county, Maine December 30.

This is a machine of the most common construction, and the claim made is to "the pulleys, bands, and wooden wheels, and the manner of operating the same thereby," a claim about as good as any that could be made where there is nothing upon which to found one.

For a *Mowing and Reaping Machine;* Alexander M. Wilson, Rhinebeck, Duchess county, New York, December 30.

This, like some other mowing machines, is to be driven forward by a horse, and it has on its front a horizontal revolving wheel which carries the cutters by which the mowing, &c. is to be effected. This wheel is caused to rise with the rise of the ground, by the action of small wheels or rollers, and is itself driven by means of a band around a drum on the axle of the large wheels. There are several appendages which it would be in vain to describe without the drawing. The claim is to the fly wheel with its knives or cutters, substantially as described, together with the general arrangement of the apparatus. Similar cutter wheels have been employed, and we do not see any thing in the general construction of this machine likely to insure its operating better than other mowing machines previously patented in this country and in Europe.

From Loudon's Gardener's Magazine.

REVIEW.

The Use of Crushed Bones as Manure.

By Cuthbert William Johnson, Author of "An Essay on the Employment of Salt in Agriculture," &c. Pamph. 8vo. pp. 16; third edition. London, 1836.

The use of bony matters as manures, originated in the neighborhood of Sheffield towards the conclusion of the eighteenth century; the farmers being allowed, at first, to carry away the bone rubbish for nothing; but afterwards, when it was found of some value, a small charge per load was demanded by the manufacturers, from whom the rubbish was obtained. The use of bones as manure did not become general till the Doncaster Agricultural Association published a circular letter of inquiry, about ten years ago, which directed the attention of the public to the subject.

Such is the essence of the historical introduction given by Mr. Johnson. He next examines—1. The composition of bones; 2. The component parts of bones found in vegetable substances; and 3. The effects of, and the modes of applying bones, either broken, crushed, or in the state of powder, or bone dust.

1. "The bones of animals do not vary much in composition: they all contain phosphate of lime, and carbonate of lime, with a portion of cartilage or animal matter, with other minor ingredients." (p. 5.)

2. The cartilage of bones is composed of a substance nearly identical in all its properties with solid albumen.

"One hundred parts of albumen are composed of

	Parts.		Parts.
Carbon, - -	52.888	Azote, - -	15.705
Oxygen, - -	23.872		
Hydrogen, -	7.540		100.

It is perfectly needless to specify any vegetable substances into which the three first of these enter; for the vegetable world is almost entirely composed of them, and occasionally, though rarely, a portion of azote is also found in vegetable substances, but the three first are invariably present. The flour of wheat, the poison of the deadly nightshade, the oxalic acid of the wild sorrel, the narcotic milk of the lettuce, the stinking odor of the garlic, and the perfume of the violet, are, by the contrivance of their Divine Architect, only some of the results of the combination in different proportions of carbon, oxygen, and hydrogen.

But the chief constituent present in all bones, we have already seen, is the phosphate of lime; and how absolutely necessary this substance is for the healthy vegetation of plants, will be apparent from the following table, which contains the results of the examination by MM. Saussure and Vauquelin, and a few other distinguished chemists, of the ashes, or solid contents, of a number of vegetable substances.

One hundred parts of the ashes of the

	Parts.		Parts.
Grain of the oat yielded of phosphate of lime, - -	39.3	Seeds of barley, -	42.5
		Seeds of oat, -	24.
		Leaves of oak, -	24.
Straw of wheat, phosphates of lime and magnesia, -	6.2	Wood of oak, -	4.5
		Bark of oak, -	4.5
		Leaves of poplar, -	13.
Seeds of wheat, -	44.5	Wood of ditto, -	16.75
Bran of wheat, -	46.5	Leaves of hazel, -	23.3
Seeds of vetches, -	27.92	Wood of hazel, -	35.
Seeds of golden rod (Solidàgo Virgaùrea,) - - -	11.	Bark of hazel, -	5.5
		Wood of mulberry,	2.25
		Bark of mulberry,	8.5
Plants of turnsole (Helianthus ánnuus,) - - -	22.5	Wood of hornbeam,	23.
		Bark of hornbeam,	4.6
		Seeds of peas,	17.5
Chaff of barley, -	7.75	Bulbs of garlic,	8.9

Phosphate of lime has also been found in the common bean (*Vicia Fàba,*) and in the pea pod, or husk, by Einhof; in rice, by Braconnot; in the Scotch fir, by Dr. John; in the quinquina of St. Domingo, by Fourcroy; in the fuci, by Gaultier de Clauberry; and in many others. In fact, as Dr. Thomson remarks, *System of Chemistry*, vol. iv. p. 319., "phosphate of lime is a constant ingredient in plants."

The cultivator of the soil will not be incredulous as to the power of vegetables to dissolve and feed upon the hard substance of the crushed bones of animals, when he is reminded that the ashes of the straw of wheat are composed of 61½ per cent of silica (flint,) a still harder substance than the hardest bone. And this is not a solitary instance; for the same earth abounds in a still greater proportion in the straw of other grain. Vauquelin found 60⅗ per cent of it in the ashes of the seeds of the oat; and the Dutch rush (*Equisètum hyemàle*) contains it in such abundance, that it is employed by the turner to polish wood, and even brass." (See *Mag. Nat. Hist.*, vol. v. p. 178.)

3. The returns received by the Doncaster Association, established the efficacy of bones as manure, more especially on light soils; and Mr. Johnson's pamphlet concludes with the following general directions for their use:—

"The crushed bones have been invariably found more immediately beneficial as a fertiliser, when suffered to remain previously for some weeks, mixed with earth in heaps, exposed to the action of the atmosphere. By being thus fermented and dissolved, they are necessarily more speedily serviceable as food to the plants to which they are applied; and this observation more especially relates to the oat, barley, and other spring corn, since these do not remain on the ground for so long a period as other agricultural crops. The proportion is 50 bushels of bones, with five loads of earth or clay; or 40 bushels to five loads of common dung.

For wheat, and pasture lands, the previous fermentation of the bones is, for this reason, not so essential to the production of immediate benefit.

It is impossible to give any general directions for the quantity of bones to be applied per acre, since soil, situation, and climate, must all be taken into the farmer's consideration.

The following facts, however, have been ascertained by numerous experiments, at some of which I have personally assisted:—

1st. That crushed bones remain in the soil for a length of time proportionate to the size of the pieces; the dust producing the most immediate effect, the larger pieces continuing to show the longest advantage. On arable land their good effects continue for four years; on pasture land for eight.

2ndly. On turnips, oats, barley, and wheat, the quantity applied has been from 25 to 30 bushels per acre; on pasture land, from 25 to 40 bushels of bone *dust*, early in the spring.

3rdly. The best mode of application is by the drill, with the seed corn.

4thly. The bones should, when first used, be always applied, for the sake of correct information, in varying quantities per acre; and on no account should the farmer omit to leave, by way of comparison, a fair portion of the field without any manure."

Mr. Johnson deserves the thanks of the public for having produced this useful pamphlet. We wish we could impress upon gardeners the value of bones as a manure; because there is not a gentleman's gardener in Britain who cannot command a certain quantity of them, which are at present lost for every useful purpose. The bones could be deposited in the back sheds, and broken by the men during wet or inclement weather; and afterwards fermented in the compost ground with common garden earth. In the composition of vine borders, powdered bones, which have been fermented, form a most valuable ingredient.

From the New York Farmer.

AGRICULTURE IN RHODE ISLAND.

A short visit to Newport and Bristol, in Rhode Island, has given me a favorable impression of their husbandry; in some cases, I am half disposed to call it, gardening. Rhode Island, properly so called, on which Newport is situated, lies on the eastern shore of the State to which it gives it name, and stretches from south east to north west a distance of about fourteen miles, and with an average width of three miles. It is surrounded by deep water; and has in general a bold rocky shore with very little salt marsh, and as well as I could judge no swampy ground in the interior. It lays in the bay like a large whale reposing on the surface of the sea, without any great elevation, but gradually rising on its eastern and western sides longitudinally to an agreeable and beautiful height in the centre. It is almost entirely destitute of any other than ornamental trees; but there are a good many of these, though we regretted among these to see that the common button wood predominated, as it is almost as great an impoverisher of the soil as the Lombardy poplar. The moisture of the climate gives to the landscape that bright and beautiful green, which is said to characterize the British Islands, and which the Emperor Napoleon so much admired. The island seems based upon a rock, a kind of slaty granite; and the water, which is easily obtained, is of an excellent quality. In the north-western part of the island, anthracite coal abounds; but the coal is not of so good a kind as to encourage further operations, and the mine, at least for the present, is abandoned. In general the soil is a deep dark loam, in the southern parts more mixed with sand than in the northern, comparatively free from stone; and although it produces good crops of Indian corn, yet it seems more favorable to grass, oats, and potatoes. The fences are in general of stone, high and well built; the fields, a rare thing in New England, dividing generally into rectangular lots; and in the southern parts of the island, are fertile, richly manured, and under high cultivation. The farmers are most of them the independent possessors of the soil which they cultivate; and the houses and buildings generally in the country are remarkably neat; some in the neighborhood of the town are tasteful and elegant. Without the town I do not recollect a single house that was in a state of dilapidation or that looked like the abodes of intemperance and vagabondage. We may reasonably infer that, there being among the inhabitants a large proportion of Quakers, who are ordinarily models of neatness and good domestic management, has had in these respects a favorable influence. The climate, to those who like the proximity of the sea, is delightful in the warm months; it is milder in winter, and it is much cooler in summer than places more inland.

The stock kept upon the island are principally sheep; and these chiefly of what are called the old fashioned merino, with very little mixture of Saxony; the average yield of fleece from three to four pounds; and bringing in the market from fifty to sixty cents per pound. On land averaging in value one hundred dollars per acre, and with hay at fifteen to twenty five dollars per ton, though the price in years past has been about ten dollars per ton, sheep husbandry would seem hardly to be profitable, though they say that "sheep pay better than any other stock;" as indeed well it may, as who would think in such circumstances of raising neat cattle to advantage, when the value of a yearling would not be so much as that of a calf six week sold? They are wise in desiring to consume all their hay upon the place, for although the farms on the sea shore are favorably situated for procuring sea manure, yet in the interior they require all the manure they can make on their farms. I got information of no considerable dairy farms. Many swine are fatted on the island; and a very large amount of poultry, especially geese and turkeys, raised. For there a ready market is always to be found; but with what profit they are raised is another matter. As long as the geese are fed in the highways, the expense is nothing; but whoever undertakes to fat either geese or turkeys at the corn crib, or, as some permit them, to feed themselves among the standing corn, we advise to count the cost.

We saw extensive fields of oats, which appeared highly promising; and some most luxuriant fields of barley already suffering from their own weight. The crops of barley have for several years been cut off by an insect, whose depredations are similar to those of the wheat worm, and for which no remedy has yet been discovered. The crops of corn sometimes give fifty and sixty bushels to the acre, but the average yield is about thirty. The grass, principally herdsgrass and red top, which is a favorite grass in Rhode Island, with very little of clover, under the best cultivation, will yield two and a half tons to the acre; though this would be a very high average. As far as my own observation goes, the red-top, though a most excellent hay for every kind of stock, never yields a great weight of hay to the acre. The average crop of potatoes is about two hundred bushels to the acre. Rhode Island heretofore has been remarkable for the quality of its potatoes. A kind called the Elam potatoe, a long, white, kidney potatoe, taking its name from a gentleman who first cultivated it here, was a long time celebrated; but has given place to the pink-eye and the Chenango. A very great crop here, and one more cultivated at Bristol, is the onion. The cultivation is said somewhat to have declined on this island; the crops for some cause not having yielded so well as formerly; but at Bristol, about fifteen miles above Newport, it is pursued very extensively and successfully. The produce of the onion crop last year in Bristol, I have been credibly informed, exceeded thirty thousand dollars. The red onion is that which is principally cultivated, being the greatest favorite in the West India market. The cultivation of the crop is simple and well understood. A good crop will give from four to five hundred bushels. The cost of cultivation very much exceeds that of corn; some give it as their opinion three times as much labor is demanded on an acre of onions as on an acre of corn. They are subject to few casualties, provided the seed is good; and the seed is never safe, if more than one year old. It is a singular feature in the habits of this plant that it bears planting year after year, without any diminution of the crop, on the same ground. I saw one field of two or three acres on which onions had been grown every year for more than forty years, and with equal success. The land pays for manuring well; though they are not particular as to the kind of manure applied, prefering however a rich compost to green manure. The large sized onions are put in barrels; the smaller sized are strung in bunches; the weight of the bunches being about three and a half pounds. The land is marked out in rows about one foot wide with a machine resembling a boy's sled with four runners, making three rows at a time, one runner being kept in the fourth track of the last marking. The seed is then dropped and covered very slightly by hand, in hills about six inches distant in the row; and four plants are generally left standing in each hill. The great business afterwards is to hoe them, and keep them free froom weeds. Two kinds are cultivated; an early and late kind. The former are usually ripe in August, and sent to market as soon as may be after ripening. The crop is, upon the whole, of easy and profitable cultivation. I was at the house of one farmer on the island who keeps about one hundred sheep, and who the last winter applied his onions, which were too small for the market, to the feeding of sheep; and he adds, with advantage to the sheep; a use of onions, I venture to say, altogether novel. The advantages of obtaining sea manure both at Newport and Bristol are very great; but particularly at the former place. Vast quantities are constantly driven upon the shore by winds and tides; and much is gathered in boats from the rocks. It is used in compost and as top-dressing. The eel grass is seldom used, but in compost; and principally as litter for swine; the rock weed has great effect, when applied as top dressing on grass ground. Common beach sand is likewise used as top dressing, and in compost, with advantage. I have myself tried it in moist cold soil, in the hill of potatoes, with success. But one of their principal manures is the "Manhayden" fish; a small fish, in appearance, resembling the herring or alewife. These are taken in great quantities, in large seines; and are sold at the rate of fourteen cents per barrel for manure. They are most frequently spread broad-cast among the growing corn, and left undisturbed upon the surface; or they are carried into the barn yard and mixed in compost. Their effects in either case are said to be very powerful. The odor of them, while rotting in the field, is most certainly powerful.

It is obvious that I could give but a cursory view of the agriculture of these places. But I can say with propriety that their agriculture, though admitting many obvious improvements, is highly respectable; and the island, from its remarkable salubrity, the fertility of the soil, and the beauty and many advantages of its situation, seems destined to become a favorite place of residence for industrious and enterprising cultivators and improvers of the soil, and of luxurious resort to the fashionable and wealthy. The island contains an inexhaustible supply of excellent building stone; of which two large cotton factories, propelled by steam, have already been erected, and others are in embryo. The population of Newport, at present, is about eight thousand; there is every encouraging prospect of its large increase. The projected and indeed half finished rail road between Providence and Stonington, in Connecticut, seems likely to divert the travel between Boston and New York in that direction.

H. C.

July, 1836.

REPORT ON THE NAVIGATION OF THE UPPER ROANOKE, BY MEANS OF STEAMBOATS OF SHALLOW DRAUGHT.

Communicated for publication in the Farmers' Register.

Lawrenceville, June 20th, 1636.

To Col. Andrew Joyner, Superintendent of the Roanoke Navigation Company.

Sir—Agreeably to the order of the Board of Directors, made at their meeting in April last, I set out, on the 12th day of last month, to perform the duties assigned me. The people of Clarkesville, most promptly and liberally responded to this effort of ours, by appointing Tucker Carrington, Esq., to accompany me, from whom I received much assistance.

From the Hon. Walter Coles, and the Hon. B. W. Leigh, we obtained every assistance they could give us in our investigations, by procuring and giving us letters to all persons in our route most capable of aiding us in obtaining the information we were seeking. These letters enabled us to make the acquaintance of many persons in the city of New York, and the States of Connecticut and Massachusetts, best acquainted with the subject of steam navigation in shoal water. In T. B. Wakeman, Esq., of the American Institute of N. York, Alfred Smith, Esq., of Hartford, Con., and Charles Stearns, Esq., of Springfield, Mass., I found gentlemen well acquainted with the subject, and who were not only willing, but did put themselves to much trouble and inconvenience to oblige and assist us in every thing we desired. And although we applied to no one who did not manifest the greatest willingness to assist us, yet I should be doing injustice to myself and to one of the most valuable and worthy men in New England, did I not in a most especial manner acknowledge the great kindness and service rendered us by Alfred Smith Esq. Mr. S. like all his countrymen, is engaged in business, to which he devotes himself with great assiduity; and his worth being duly appreciated by his fellow townsmen, much of the public business is thrown on his hands. Notwithstanding all this—and although at the time of our visit to Hartford, he was superintending the erection of a large public building—he gave us many hours of his time every day, during our sojourn in that city. He had been superintendent of all the improvements on the Connecticut River, and knew all the facts in relation to them. He gave me a duplicate of the profile of the canals and locks around the falls; and a survey of the river, made under his direction; which I will send you for the use of the Roanoke Company, by the first opportunity.

Every person to whom we mentioned the object of our visit to the north and east, invariably directed us to Thomas Blanchard, as the man to be consulted and employed by us. Indeed the unanimity with which all recommended Mr. Blanchard, was astonishing—but when we went to Hartford and Springfield, and saw the steamer Massachusetts, ascending the Enfield falls, and what he had done in the United States' Armory at Springfield, we too, had no doubt of Mr. B.'s ability to put steam-boats on the Roanoke, if mortal man could.

This extraordinary man was a common artisan in the United States' Armory at Springfield, and I was told by Col. Robb, the superintendent, that he had added improvement to improvement in the machinery there, until it would seem to be as perfect as the art and wit of man could make it—the principal of which, however, is the machine for *turning* gun stocks, and any irregular figure. But the improvement for which, perhaps, his country will be most indebted to him, is his steam-boat for shoal water—it might be more appropriate to call it an invention—for it is built on a new principle. This gentleman I lost no time in engaging for our service; provided you should sanction it. By promptly adding your request to mine, you will soon have an opportunity of learning from Mr. B. himself, what he has done, and what he can do on our river.

I shall now proceed to mention such facts as I have collected, and I shall also venture to give you some conclusions I have drawn from those facts. Being, however, entirely ignorant of engineering (never having had my attention directed to such pursuits,) my conclusions must be received with great allowance.

The better to appreciate and apply the facts to be detailed, some account of the Roanoke, Dan and Staunton Rivers, will be necessary. The facts here stated of those rivers, are extracted from the surveys &c. of Messrs. Moore, reported after the death of the principal engineer, by Mr. Isaac Briggs, to the Board of Public Works. The distance from Rock Landing to Clarkesville, is 60 miles—from Clarkesville to the highest point of the the survey up Dan, is 125 miles—and from Clarkesville to the highest point of the survey up Staunton, is 109 miles. The whole fall from Rock Landing to Clarkesville, is 156.60 feet—average fall, per mile, 2.61 feet. Whole fall from Clarkesville of the 125 miles surveyed of the Dan River, is 277.47 feet—average fall per mile, 2.221 feet—whole fall of Staunton, from Clarkesville in the 109 miles surveyed, is 322.61 feet—average fall per mile, 2.96 feet. It will, from this, be seen, that the navigation of the Staunton is the most difficult—and that of the Dan the best of the three rivers.

In one material thing these surveys are very deficient; namely, the fall throughout each mile; for although a fall of ten feet to the mile, might be easily overcome, if equally distributed the whole distance, yet, as is frequently the case, if the whole fall, or a large portion of it, occurs at one or two places in the mile, it might defy all the power of man or steam. In other instances too, the survey only gives the fall for two, three, four and five miles; and frequently from place to place, so that the distance cannot be accurately known. This occurs most frequently on the Dan and Staunton rivers; on the Roanoke, the fall in the mile is generally stated. The falls in the Roanoke, which require to be here noticed, are Eaton's, fall in the mile 11.1 feet—Hamlin's Shoals, fall in two miles 16.11 feet. The next mile above these two, (having no name to designate it,) fall, 5.98 feet. Pugh's falls, fall in the mile 5.62 feet. Horse-ford fall in two miles 8.95 feet—and Butcher's Creek, being two miles long, fall in one mile 5.60, and in the other 5.50 feet. On the Dan the only ones I shall notice, are those of Hyco—they being the only obstruction for some 50 or 60 miles above Clarkesville. These falls are about 1¾ miles long, fall 12.89 feet. On the Staunton, Fally's falls are the only obstacle to Brookneal—and it is useless to notice any other on that river. Here, the survey is too inaccurate to enable me to ascertain the distance to which is affixed the fall mentioned; but as well as I can understand it, the rapids must be about 1¾ miles—in which distance, the whole fall is 15.23 feet.

I will now beg leave to conduct you to the Connecticut River, and lay before you some minute statistics. From Hartford (below which, the river is free from any obstruction) to the foot of Enfield falls is 12 miles—fall, not more than two or three inches to the mile, and the water smooth. Enfield falls are nearly 5 miles from head to foot; with one mile of slack water between the upper and lower falls. The lower falls extend nearly 2¼ miles (half a mile of which is slack water) and has 20 feet descent—principally, if not entirely, confined to two miles: within these two miles, there are a succession of rapids—one or two of them greater than the others. After the termination of the lower falls, one mile of slack water intervenes; after which, we come to the upper falls, being one mile in length, and having a descent of 10 feet—the descent is unequally distributed, being most of it in three bars, namely—at Enfield bridge—Mad Tom Bar—and Surf Bar. From the head of the falls to Springfield, is 8 or 9 miles—and from thence to the foot of Headly falls, is about 8 miles farther; making the distance of 16 or 17 miles, from one fall to the other—in all which distance there is slack water, and fall of only a few inches to the mile. One mile below Hadley falls, however, you have Williamansett falls, being not quite such hard water as upper Enfield falls. Hadley falls have a descent of 50 feet in 2½ miles, around which there are locks and a canal through which, all boats and rafts are obliged to pass. From the head of Handley falls to Miller's falls is 35 miles—with sand and gravel bars—having by actual admeasurement, only between 8 and 9 feet fall in the whole distance. Above Miller's falls there is more rapid water, where steam boats have been tried without much success—owing, it would seem, more to the want of employment, than to their inability to navigate the river.

But to return to Enfield falls (where we have actual experiments and well attested facts for our guide)—several boats were put on the river and abandoned, before they got one to succeed. There are now two passage boats, and I believe two tow boats. The passage boats, are the Vermont and Massachusetts—the former, intended to run in low water, is 75 feet long—including wheel, 13 feet wide—draws 19 inches. The Massachusetts is 97½ feet long, including wheel (which is in her stern) 13½ feet wide—draws 22 inches of water when laden, and has two engines of 17½ horse power, each. Aboard of this boat I passed over Enfield falls, three times. She can carry 75 passengers, has no accommodations for night or meals—but comfortable cabins for both ladies and gentlemen. In ascending the lower rapid 2½ miles, she cleared them handsomely and with ease, in 42 minutes; and she went up the upper falls (being exactly one mile) in 23 minutes by my watch. Descending, little or no steam is used—ascending, the boat is quite obedient to the helm; but when the current is extra strong, poles are used to keep her steady—descending she is also steered by a tow oar. She makes a daily trip from Hartford to Springfield, 26 miles, and back—going up in 5 hours, and returning in 2½ hours—has run with regularity and entire success, for four years; and is considered as good property, as any in New England. She, as well as the Vermont, was built by Thomas Blanchard. Her crew consists of 5 hands, including captain and pilot—her expenses are about $100 a month; and cost about $6000; but owing to the advance in labor and materials, it is probably that such a boat, would now cost more.

Around Enfield falls as well as the other falls on the river, there are locks and a canal, through which the freight and tow boats pass—though the tow boats have gone up Enfield falls, it is found to be best to go through the canal. These two boats can carry 150 tons, at the rate of 2½ miles an hour—against the current of 1½ miles an hour; but experience proves, that towing less than that, is much better. The William Hall, one of the tow boats, has ascended a rapid of 9 feet in the mile, towing up 20 tons—her engine is 20 horse power, and she cost between four and five thousand dollars. At Hadley falls, after the freight boats get through the canal, they are taken in tow by another tow boat, at the head of the falls, and carried up to Miller's falls.

Before steam boats were used on this river, above the falls, the trade was carried on by means of freight boats of 25 tons, with a sail, to be used when the wind was fair. When these boats ascended Enfield falls, they took in additional hands, so as to have one hand to the ton, when they were propelled by poles; and I was told that it was as hard labor as men could endure: it frequently consumed the whole day to get one of them over the falls, 5½ miles. Here, steam *has* succeeded, both as applied to passage and tow boats—and it could seem from this, that where a man can push a ton up a current, by means of a pole, steam can be employed with success, profit and regularity.

The Connecticut, upon an average, can only be used for navigation seven months in the year—it is ice-bound for three months and a half, (last year much longer,) and the water is too low for one and a half months in the summer. I saw Mr. Goddard in Hartford, who is the proprietor of the steamboats on the Altamaha, Ockmulgee, and Ockonee rivers, who informed me that they were entirely successful. I was also informed by Mr. D. Copeland, of Hartford, that he had succeeded in putting a steam-boat on the St. Lawrence, where the fall was much greater than at Enfield: but I was unable to get the particulars in consequence of Mr. Copeland's being obliged to leave Hartford for N. York, unexpectedly. Mr. C. is an engine maker of high reputation, and a man of high standing. Mr. Blanchard has also succeeded, (though not to the same extent that he has on the Connecticut,) in putting steam-boats on the Kennebeck, Genesee, and Susquehanna rivers: in the latter, he informed me that he had ascended some half a dozen mill dams. This boat, however, did not run long, and she has not been repaired, or replaced by another.

Here, perhaps, with strict propriety, my communication should close; but some opinions must necessarily have grown out of what I have seen and heard—and I hope I shall be pardoned for expressing a few of them. This, however, considering the position of things, may do little else than draw forth a denial of the facts stated, and unfriendly criticisms on the conclusions and reasons which I shall give. The improvements made by the Roanoke Company, have brought into existence so many rival schemes for monopolizing the trade of the upper country, that almost any opinion which may be expressed, will be *charitably* ascribed to a wish, to promote one, or put down another. I have what to me is a considerable interest in the Roanoke Company; and I am entirely unconnected with any other of the various and conflicting interests on, or pertaining to the river. I have looked at this subject exclusively as a stock-holder of the Company—and every thing I have done, and what I shall say, will have no other end in view, but the advancement of its interest.

The most important conclusion I have come to, is, that steam-boats can be put on the Roanoke and its two principal tributaries, with profit and success—whether they will be able to navigate the *whole* of the Roanoke, Dan and Staunton, remains to be tested by actual experiments; but that they can be successfully and profitably employed on a large part of all three rivers, and that too, without the Company's incurring much expense in further improvements of the beds of the rivers, I have as little doubt as I can have of any thing not yet demonstrated. The facts above stated, I think, abundantly warrant this conclusion. There is but one fall on the Roanoke greater than that of Enfield; there is not one on Dan or Staunton, for a considerable distance up both streams so great. Why, then, (it may be asked,) may we not ascend our rapids as well as they do those on the Connecticut?

From the head of Pugh's falls, almost to Danville, there is no rapid equal to the falls of Enfield by several feet to the mile—there are but three which can be considered as opposing any real difficulty—namely, the Horseford, Butcher's creek, and the Hyco falls. The Horseford has 8.95 feet fall in two miles, Butcher's creek has a fall of 5.62 feet in one mile, and 5.59 feet in the other, and Hyco has 12.89 feet fall, in one mile and three-quarters. The only fall on the Staunton below Brookneal, of any magnitude, is Tally's falls, where the descent, in one mile and three-quarters, is 15.23 feet—making in all, only four places to be overcome, to render the rivers accessible to steam-boats for largely upwards of one hundred miles, on the Roanoke and Dan, and about fifty miles on the Staunton. If nothing else could be done but to rescue these portions of the rivers from the state of comparative uselessness in which they at present are, would it be nothing? It appears to me that these improvements, (if indeed any are required to be made,) can be done by the company in a short time, and with but little expense. I am sensible that the Board of Directors, at their last meeting, directed that the work should be commenced at Rock Landing; but I think the policy of beginning at the head of Pugh's falls, and bestowing the first labor on the Horseford, Butcher's Creek falls, Hyco falls, and Tally's falls, is so obvious, that you ought to do, what I am sure the Board would do, had they now to decide the question again. Our policy is, certainly, to apply our labor so as to open as much of the river as we can, in the shortest time, and with the least expense: in what other way can it be done?

Let us consider for a moment, that these four obstacles are removed, and steam-boats can navigate the rivers as above supposed; there would be an immediate, easy, and expeditious communication between Danville and the Gaston rail-way, by running stages a short distance down the river, from Danville to the boat; and from the head of Pugh's falls (about 7 miles) to Gaston. And there would be nothing to prevent another boat's running from Brookneal to the same place. I do not think it improbable, in such a state of things, that a toll of one dollar for each passenger, would give the company more revenue, than all the other tolls put together.

As to the falls between the head of Pugh's falls and Rock Landing, and those high up on the Dan and Staunton, they would be attended to, after these four places should be put in order I think it not improbable that the 12 miles below Pugh's falls, will require more labor and expense than all the others: if so, the river being improved above, would give us ample revenue to work on, and remove these obstructions.

But suppose we find some place on the river which steam-boats cannot ascend? If steam cannot overcome it, machinery may; and to view it in its worst aspect, should we be obliged to change boats, and have passengers and baggage carried around such a place, still we shall have accomplished much.

All these remarks apply to passage boats: they are found to be capable of ascending worse rapids than tow boats. The latter, however, would soon follow the introduction of the former; and I have little doubt they can be turned to good account.

May I not hope, in conclusion, that this subject will engage the attention, draw out the energy, and stimulate the enterprise of the enlightened and patriotic sons of those lovely and fertile valleys? Ardently hoping it may,

I remain, dear sir,
Your obedient servant,
E. B. HICKS.

For the Farmers' Register.

WHAT IS THE BEST ROUTE, THROUGH CENTRAL VIRGINIA, FOR A RAILWAY TO THE SOUTH-WEST?

Among the great works for facilitating transportation, yet to be commenced in Virginia, no one is more wanting, or will be found, when completed, more important, than a railway to connect James River and the north and south line of railways, with south-western Virginia—and ultimately with Tennessee and the great railways which will connect Nashville with New Orleans, and Charleston with Cincinnati. The vast importance, to Virginia, of this particular improvement, is strongly impressed on the mind of every man of observation and judgment who has given attention to the subject; and the discussion of its minor features, has recently excited warm partizan feelings, and the array of opposing interests of the towns and other corporations that hope to have the general scheme made to bend to suit their different purposes, and to serve their particular interests. As is usually and unfortunately the case, the scheme of a railway in connexion with the south-west has not been viewed, by the advocates who have entered most warmly into the discussion, so much in relation to its benefit to the producing back-country, and to the state at large, as in relation to its bearing on the separate interests of the several towns, through or near which the route may be made to pass. Now, as the general good is made up of the amount of benefits derived by the several parts of a country, it is an important public and general gain, as well as particular and private, that either Richmond, Lynchburg, Petersburg, Farmville, Danville, or Abingdon, should derive increase of trade and wealth from such a public work. But I protest, in the outset of my remarks, against the interest of either of these, or any other towns, being considered of importance at all comparable to that of the producing back-country, and still less, to the general interest to be promoted by the construction of this great work. To build up all our growing towns and suitable places for trade, is highly important to the interest of the several producing regions; and more especially is it important to all Virginia, that Richmond, her metropolis, and principal commercial town, should be benefited as much as circumstances will permit, without a sacrifice of general interest to that end. Still, it is proper that all should consider this great work *in our character of Virginians*, and not merely as inhabitants or property-holders of one or other of these several towns, or of the particular region of country of which any such town may be the market. What is wanting, is the cheapest and most perfectly available means for transportation between the tide water of James River and the south-west part of Virginia—and the more towns, or places for trade, that this route can pass through or near, or can give benefit to, without damage to the great object, so much the better for the commonwealth, as well as for those particular places. So far I fully and readily yield to the claims of private and separate interests—and not a jot farther. The scheme which I shall advocate, comes in conflict with some of the private interests, or the *more dearly cherished commercial prejudices*, of every town east of the Blue Ridge, that will be affected by the improvement: and therefore, though a heavy balance of advantages may still be offered to all of them, it is probable that my views will not be acceptable to any one.

There have been two routes proposed for the eastern part of this railway, (from Richmond to Lynchburg,) and each has been advocated by friends, and opposed by foes, with that warmth of zeal which is kindled by self-interest. These are, 1. Along the valley of James River, and of course along side of the great canal now in the course of construction. 2. Along the ridge of highland which separates the waters of the Appomattox from those of James River.

The capital objection to both these plans, is, that a railway so near to James River, as either of these, would be a dangerous rival to the canal, in which the state has so great a pecuniary interest, and in the success of which, Virginia at large, and Richmond in particular, have interests much greater than merely the money invested, or hereafter to be invested in that great work. This objection is so manifest to the valley route, that we may safely assume the position that the power obtained from the legislature by the James River Company, to construct the valley railway, was asked for, not to *effect*, but to *prevent* the construction—to obtain possession of, and to keep inert and harmless, a power that would be most fatal if wielded by hostile hands. The only present effect of the existing charter to construct the valley railway, is to array another vested right in opposition to a charter for a railway on the ridge route—to which latter route is also opposed, but with less force, the objection that it would take away the business and profits, and thereby hazard the very existence of the canal now constructing. How far this objection to the ridge route is justly charged, I cannot pretend to say, or even to hazard a supposition: but to that extent, the objection ought to be allowed its full weight and force, by the Richmond interest, by the Legislature, and by the people of Virginia.

Cannot these objections be respected, and these opposing interests be reconciled—and yet be obtained, by another route, the great benefits of the south-western trade and travel, increased, as both would be, by such facilities? Such a route, free from all important objections, promising new benefits to all interests, and injury to none, I conceive is presented on the ridge which separates the waters of James River, from those flowing into Albemarle Sound. This route, (which has been recently proposed in the newspapers,) in connexion with the Richmond and Petersburg railway, would still make Richmond the termination, and doubtless the principal receiver and outlet of this long line of trade and travel: and such being the case, Richmond ought not to object to a feature that would surely be beneficial to the country furnishing the supplies of commodities and of travellers, viz: that the route would pass through another town, Petersburg, and thereby would permit, whenever desirable, a different destination to travellers, or to the products of the country. If this road, on the whole, was more profitable to the stockholders, and was not more expensive of time or money to their customers, surely it would be highly advantageous that there should be two or more markets offered, instead of one only.

But it will be at once objected to this southern route that it is much longer, and therefore, that a railway thereon would be much more expensive, both to construct and to use, than on the ridge north of the Appomatox. If so, then it certainly ought not to be adopted, unless, indeed, there should be other sources of additional profit to the stockholders, and of advantage to the public, more than equal to any possible increase of cost on the former route. Such advantages and disadvantages cannot be estimated and compared, with even an approximation to truth, until after a correct survey of both routes. But with the present imperfect light on the topographical features of the country, it may be well doubted whether *Richmond* would not be reached as quickly, easily, and cheaply, from Abingdon, or from New London, by passing through Petersburg, as on the ridge north of the Appomattox. I ask attention to my reasons from those who may be ready to pronounce this opinion as not only incorrect, but absurd and ridiculous.

Let us first consider the comparative facilities offered by both routes for railway construction, and for the after transportation on both.

The route between the James and Appomattox being on the ridge which separates the tributaries of the two rivers, may be supposed to be not very far from level. But to keep on that ridge, the route must have many curves—and it would be generally within a few miles distance of good navigation, either on Appomattox, James, or Willis' river—all being in the same direction, and having the same eastern termination, with the railway. It follows, necessarily, that a region of country to which three navigable rivers, and hereafter the canal, will be so accessible, will furnish scarcely any country produce to the railway, and will as little require its aid to bring back foreign commodities. This is, indeed, fully admitted by the advocates of that route, who make use of that admission as ground to maintain that such a road could not take away business from, and therefore would not affect the success of the James River canal. When the improvements of the James and Appomattox, (both now in progress,) shall have been completed, no counties in central Virginia will be so well supplied with facilities for transportation to market, as Chesterfield, Powhatan, Cumberland, Buckingham, and Prince Edward, through which this railway is to pass—and therefore, to aid the transportation of commodities, the railway is not wanted, and would be in that respect of no value.

The ridge south of the Appomattox is remarkable for its long-continued level, and not far from direct course, as far west as New London. Between that place and Petersburg, if the traveller will keep on the dividing ridge, he will not cross a single stream, a ravine, or a hill. Such is the report of the remarkable features of this line by those who know it best. Such level ridges are not rare in middle, and are still more frequent in lower Virginia: but it is seldom that one so long, or so direct, as this is found in a similar region. The same course continued would still be on a very level route, by Liberty to Buford's Gap through the Blue Ridge, directly as can be, and on the best possible route to Evansham and Abingdon. All the route, however, west from New London, would be common to both of the eastern routes proposed.

It is not to be supposed that a railway could be kept on the summit of a ridge, even if the location offered a perfect level. The interlocking of the head springs of the streams flowing to opposite sides, would often affect the straightness of the ridge. But these streams, so near their sources, would not be much below the general level, and would not be expensive to be crossed by nearly level construction. Allowing for such straightenings in various parts of the line presented by the middle of the ridge, the line would pass from Petersburg, or (to be more precise,) from the Petersburg & Roanoke Railway, a few miles south of Petersburg, through Dinwiddie, by Nottoway Court House, and nearly along the line which separates Lunenburg and Charlotte on the south, from Prince Edward on the north: and this route is every where so distant from any existing or contemplated improvement for transportation, that the railway would convey all the marketable produce of the adjacent country, and yet take away no business or profit from any other road or navigation. At New London, or before, the two ridge routes would unite: and therefore the western construction of the railway would be the same for either plan.

Next, as to the comparative length of the two routes for railways. According to Wood's and Boye's large map, the *straight* lines from Richmond to Lynchburg, and from Petersburg to Lynchburg, are very nearly equal—the latter being 1½ miles the longest; and the straight lines from the same towns to New London, are precisely equal. But even if the map does justice to the more southern lines, (which there is good ground to doubt,) the comparison of the practicable road routes would be still more favorable to Petersburg. The actual road distance from Richmond to Lynchburg, (by mail computation,) is 120 miles: and it may be presumed, that this is the nearest and best route, because the road is so much used, that if not direct, it would have been made as nearly so as the nature of the country would permit. On the contrary, it may be truly said, that there is *no road* from Petersburg to Lynchburg, because there has been so little trade or travel from one of these towns to the other, that there was no necessity for obtaining the shortest route. Any one of the roads by which the traveller could now pass from Petersburg to Lynchburg, would be made up of several shorter roads connecting intermediate places, but each place lying considerably without the best or most direct route for the entire distance. Thus by connecting some of these roads, the present *nearest* travelled distance from Petersburg to Lynchburg, is 117 miles, by received computation: and persons well acquainted with the whole country, are decidedly of opinion that the distance could not exceed 110, if a road had been traced with the design of passing merely from Petersburg to Lynchburg. But admitting the uncertainty of all estimates of distance, based merely on opinion and computation—and claiming merely equal nearness from Petersburg to Lynchburg, (which cannot be questioned,) it will follow that New London, which is on the ridge, and in the direct best route to Abingdon, (and thence to Tennessee,) is as much nearer to Petersburg than to Richmond, as it is more southward in position than Lynchburg. The latter town is not only out of the proper route, but is surrounded by a very hilly country, which would make the construction of a railway *across the course of the streams* very costly—though it could be easily reached by a short branch from the railway, laid on one of the ridges between two of these streams—and which branch would be necessary, and sufficient, to accommodate the Lynchburg travel. Besides the advantages gained, in less distance and more perfect level, by keeping the railway route southward of Lynchburg, there would be thereby avoided any conflict of interest with the James River Canal—and besides, the more distant the road from the river, the greater would be its use and its profits, in transporting the produce of the southern counties, which have, and can have, no cheaper way of reaching their markets than this railway would offer.

Now, if the supposition that the length of the ridge railway route from New London to Petersburg would be 10 miles less than the one to Richmond north of the Appomattox—and that the more perfect level of the former gives it a further comparative advantage of 10 miles—then it would be clear that Richmond, *considered as the ultimate destination of both routes*, would be reached as cheaply by one as by the other—because 20 miles is precisely the distance from Petersburg to Richmond—and through which a railway will be completed before operations are fairly commenced on the great western route. The line of new railway which I advocate, would join the Petersburg and Roanoke railway about three miles from its eastern termination in Petersburg—and if that route was chosen, the town of Petersburg would doubtless, if governed by enlarged and sound views of self-interest, *permit the railways to be connected, and continued northward, without the least obstacle or detention.* Thus 24 miles *of what might be then considered as part of the great south-western railway*, at the Richmond end, would be actually completed and ready for use, and for that extent requiring no investment to be made, or risk to be encountered, by the new company.

But, suppose that I have overrated the balance of advantages, as to distance and level, of the southern route—and that 10 miles would be enough to allow, on either or both grounds, instead of 20 miles. This change would make Richmond 10 miles nearer by the northern ridge, than by the southern, *via* Petersburg. Even then the latter would still be the preferable route. The northern road, though shorter by 10 miles, would have to be constructed throughout, save about a mile next to Richmond. But of the other, 24 miles would already have been constructed by other companies, and would be at once available as part of the great south-western line: and 24 miles of *completed* railway is not so great an obstacle, as half that distance requiring construction—unless indeed the subscription and support were most abundant, and the profits of the investment great, and absolutely certain. The company owning the Richmond and Petersburg railway, have the strongest inducements to approve and to aid the adoption of this route—*as its being made the eastern link of the* *great south western line, would probably double the trade and travelling that it will otherwise convey.*

According to the grounds assumed, it seems that by this plan the great *and indispensable* national object of a south-western railway may not only be gained for Virginia, but that, with that end, there will also be secured aid and profit to every particular existing interest, whether of towns, of back country, or of public works, and corporations owning them.

This rail road cannot abstract the least amount of transportation from the James River Canal—a public work which every Virginian ought to desire to be treated not only with *justice*, but with *liberality*, by the legislature—and neither to be crippled or endangered, by permitting the improper rivalship of other routes not essential to the public good. But a south-western railway *on some route* the public interest demands imperiously, and sooner or later, *it must be constructed.* This route, therefore, which can take away no trade from the canal, but will give to it much, (in commodities to and from Tennessee, through Lynchburg,) ought to be viewed by the powerful canal interest, not only without jealousy, but its adoption favored as the sure means of avoiding other schemes which would establish dangerous, if not fatal rivals.

An extensive and productive region of Virginia, which is now wretchedly provided with ways to market, will be able to use this main railway; and this supplying region will probably be much extended by a branch rail road from Danville to the main line.

Though the route here advocated will not pass through either Farmville or Lynchburg, yet branch routes can be constructed to both, that will probably serve private interests as well, and the public and general interest far better.

Of the immense amount of new or additional products, and of travel, which this improvement would transport from and to the south-west, different parts of the profits would fall into the hands of each of all the towns that have been named: and the share of each, would doubtless be much greater than all that it can possibly now receive from the same sources. Richmond, owing to her superior wealth, population, and more fortunate position, would of course receive much the largest share—and therefore she would act most foolishly to oppose this scheme, merely because her's was not the only market reached, and that her sister towns would derive highly important advantages. It is hoped that Richmond has views of interest sufficiently enlarged not to be governed by any petty and illiberal jealousy of weaker competitors. *If she fears rivalship, let her look to Baltimore:* for if we lose time in disputing about the proper route, and the proper distribution of profits among the towns claiming shares, that enterprising city will extend her lines of trade quite across Virginia, and tap the very sources of the wealth now offered to our acceptance, before we shall have determined through what channel it may be permitted to flow.

A convention has been called to meet at Charlotte Court House on September 5th, for the purpose of discussing the expediency of constructing a rail road from Danville to Farmville, and thence to Richmond. It is earnestly hoped that the invitation will not be slighted—that the meeting will be attended by men of zeal and intelligence, disposed to act and to aid, as well as to propose and to debate, from all the neighboring counties—and that, when there assembled, they will give due consideration not only to the particular scheme to which their attention was first called, but also to this and other schemes, for a railway connexion with the south-west.

It is a circumstance as gratifying as it is novel, that the people of the country are already moving in this matter, with zeal and effect. Let them but continue to exert all their energies, and they will not fail to attain whatever object they may determine to pursue. The *country*, heretofore, has done nothing in commencing, or directing the routes of rail roads. They have been commenced, and directed entirely by different towns, and solely with views to their own particular advantage. Of this we have no right to complain. Those who plan, and mostly pay for, a great and expensive work, have a right to direct it so as best to secure their own interests. But if the *country* will shake off its inertness on this subject—and will bring into exercise the dormant forces of its influence, wealth, and power, this great work will be so shaped as best to promote the general prosperity of Virginia.

To the consideration of the individuals who will meet for this purpose at Charlotte court, especially, I beg leave to recommend these views.

R. N.

August 7th.

[As the subjects treated by the two foregoing pieces are now engaging much attention, and the interest felt, recently as it has been excited, is rapidly increasing and spreading, we have thought fit to send forth some extra copies of this sheet, to the towns and counties most interested in both these schemes of improvement some weeks in advance of the regular issue of the Sept. No. of the Farmers' Register. We are willing to sacrifice something of the novelty and interest of this No. by thus anticipating parts of its contents, hoping that it may induce earlier reflection, and more deliberate action, on these subjects, which are so important to the welfare of Virginia.

We take this occasion to remind civil engineers especially, and all other persons who have devoted attention to the subject of canals, railways, and other public improvements, that the full consideration of this subject was always one of the objects embraced in the plan of the Farmers' Register—and has been deemed second only in importance to matters of instruction on practical agriculture. Well digested views presented in original communications for this journal, on any of the plans for facilitating transportation, which are important to the public interest or to particular regions of considerable extent, will at all times be gladly received, and given a *durable* as well as an early place before the public, by being embodied in this work.

The Presidents of incorporated companies directing canals, railways, &c., would aid this general design, by sending concise statements of the present state of their several works; and in future, notices of all such new occurrences, as are necessary to be known, to enable us to keep our readers correctly informed of the progress of all our valuable works for facilitating transportation. Ed. Far. Reg.

ON CURING TOBACCO.

To the Editor of the Farmers' Register.

I ought before to have redeemed a pledge I gave in a former communication, that I would, in due time, say something upon the subject of curing tobacco. But the great draught on my time, which is unnecessary here to state in detail, has prevented it. And, indeed, there are so many cultivators who eclipse me, and (by close personal attention, which I cannot give on account of the extent of my business,) understand the minutiæ of it better than I do, that I really feel some delicacy in the attempt. I will, nevertheless, endeavor to explain the general principles upon which the process ought to be carried on, which, in truth, is nearly all that can be done in the compass of a communication not too long to be read. It may be of some use to those who are novices in the business.

In the first place I will remark, that the sap in tobacco contains more oil than any plant with which I am acquainted. The whole art, then, consists in evaporating the water from it, so as to leave it in the purest possible state, and the greatest quantity. To effect this, it is all-important to let it be as ripe as possible before it is cut. I believe it may be assumed, that nine out of ten cut too soon, though the number of them has been diminishing, since the dealers in the article have taken up the habit of admonishing them. The first step it takes is to assume yellow spots. This should begin in the field, if it does not fire so much as to make it necessary to save it from destruction, and many are induced to cut it for this cause, when perhaps a change of weather, from wet to dry, might stop it, as it frequently does. But this question can only be settled by observation and reflection. Although it assumes the yellow spots in the field, it is still proper to let it stand two, three, or four days, according to circumstances of heat and moisture in the atmosphere, when if it ripened green in the field, which it will sometimes do, it should begin to assume these yellow spots in the house. The firing should then commence in a very small way, and be very gradually increased for several days, till it will bear such a degree of heat as will cure the thin parts of the leaf, and the small fibres. It should then rest a day or more, to allow the stems and large fibres to diffuse the sap which is in them, and afford an opportunity to evaporate the water, and leave the oil in the leaf, where it ought to be. But when the process of firing is commenced, the tobacco should never be allowed to get in high order till the stems are cured. After this is done in great measure, it is well to let it rest again, and send out the remaining sap to gain as much oil as possible in the thinner parts of the leaf. Let it be noted, that whenever the tobacco suffers for want of fire, it will be known by the "strutting" of the leaf, which should never be suffered after it is first "limbered" by the sun when it is cut. The strutting of the stem is produced by the flowing back of the sap from the leaf into the stem which it has a tendency to do when it requires heat. It is this which impoverishes the leaf along the stems. During the early part of the process of curing, care should be taken to let it have air, otherwise it will sweat, and the oil will be cooked in the water, instead of the water being evaporated from it. To this end it should be hung thin, say, in large tobacco, not more than nine plants on a stick, and the sticks 8 or 9 inches apart at least, according to the size of the tobacco. During the first resting spell indicated above, if house-room be scarce, it may be re-hung by putting the plants from four sticks on three, or three upon two, as the case may be. This saves room and fire too.

The reasoning above is to show the necessity of heat in curing. As far as the sun can be substituted for fire, it is proper to use it, more especially when it is first cut, when it should be kept on a scaffold as long as it is safe from rain. But when there is a very full crop for the hands, it is hazardous to trust too much out at once. The judicious plainter will regulate this by circumstances. I once saw a crop of eight hogsheads sell for nearly double the price of similar tobacco, because it was cured by natural instead of artificial heat, in houses entirely open (as it was said) on the south side, the weather being favorable for the object. It is unnecessary to state that the manufacturers prefer that which is cured with as little fire as possible. It is difficult, however, to cure a large crop without a good deal of fire. It may be well to observe, that tobacco, like bacon, is cured in a variety of ways, by different persons; while some will be good in each way.

There is little doubt that the foregoing observations will be criticised by some who may perhaps understand the subject better than I do. If so, my object will be attained by eliciting the practice of others. Something may be gained by adopting parts of each, or letting each pass for what it is worth.

While I have dwelt on the quantity of oil contained in tobacco, I have said nothing of another ingredient which it contains in large proportion, viz: saltpetre. It is very common in rich tobacco, to see it exude from the stems so as to make it white with pure saltpetre. This, however, when it is seen on fine tobacco, is a proof that it was not sufficiently fired; because it ought to be expelled from the stem and circulated in the leaf, where it should be incorporated in the oil. As a proof of the quantity of this ingredient, I will mention a fact within my own knowledge. During the revolutionary war, my father was in the habit of boiling his tobacco stalks, and pouring the water into a number of rough trays, with pens of sticks rising to the surface of the water, to which the saltpetre attached itself in delicate spangles like icicles. This was stroked off into a dish in its pure state. In those days, there was more carelessness in curing than at present, otherwise the saltpetre would not have been allowed to remain in the stalks in so large quantity.

Before I close this communication, I must warn such as gave credit to my former communication on the subject of packing plant land for burning at a future day, that in several instances my last effort failed. In the month of October a rain fell, which wet the land under the brush and wood more than I had supposed. A threatening prospect for more induced me to set fire to them, and several that were wetter than the rest made a poor turn-out. If I had waited till November, as I generally do, a dry spell had put them in fine order. Another evil also attended them. The unprecedented quantity of rain which fell during the winter, forbade my chopping them lightly again before sowing, and the ground became too compact. This would not have been the case if they had been made rich enough. I shall hereafter endeavor to pen my cattle on them in the spring before the grass seeds, and before the brush and wood is put on, or make them much richer with manure that has no seed in it.

A PLANTER.

REMARKS ON THE (SUPPOSED) GYPSUM DISCOVERED IN NEW YORK, AND THE PROBABLE EXISTENCE OF A SIMILAR SUBSTANCE IN WESTERN VIRGINIA.

To the Editor of the Farmers' Register.

Big Lick, Botetourt, Aug. 6, 1836.

I have met with nothing recently, which has surprised or puzzled me more than the recent developments in New York, respecting the rock in Moore's well, and the principal *plaster* beds in the State. It brings to life exploded theories, which, a few years since, had many supporters in the Valley of Virginia.

There are numerous localities in this country, where the limestone crops out at the usual angle with the horizon, but from peculiar causes, not well understood, is subject to constant and rapid disintegration. It is softer, and from the inexhaustible fertility which it imparts to the ground over which it is scattered, it has been supposed by many, to possess the virtues of gypsum. By the farmers it is called rotten limestone, and some have had it pounded, ground, and sown, as is customary with plaster, and claim for it equal activity. The experience, however, is so limited and contradictory, and the lights of science so adverse to its efficacy, that until the arrival of your last No., (3rd,) I have had no hesitation in attributing, what seemed to be the effect of the powdered carbonate, to other influences. I cannot, for a moment, believe, that either the carbonate or sulphate of lime, sown over the ground in the usual quantities, can be of any value, mechanically. Their attraction for moisture, when pulverized, has had an importance attached to it which ignorance alone could have encouraged; for, aside from their solidifying what they absorb, how triflingly inconsiderable must be the moisture attracted by a few handfuls of dust scattered over an acre of ground. Gypsum being soluble in from 300 to 500 parts of water, and being found by analysis an important constituent of those plants upon which its action is most striking, enables science to unfold its mysteries with tolerable clearness. But the *carbonate* being insoluble, seems to cast an impenetrable veil over its *modus operandi* if we admit its influence upon vegetation to be the same with plaster. We are always backward and unwilling to admit what seems to be at war with the settled principles of science, and yet we are every day encountering stubborn facts, before which, speculation must give way, and to which, principles, however revered for their antiquity, or stamped with value by the approbation of the wise and the learned, must accommodate themselves. Now, it has been a received opinion, that the carbonate of lime is insoluble; the correctness of which, is sustained, not only by the ordinary chemical experiment, but by the fact that the soil throughout the Valley of Virginia, and other timbered calcareous regions, even when lying in immediate contact with limestone, affords upon analysis, not the slightest evidence of the existence of lime. For this last remarkable fact, we are measurably indebted to your experiments[*]. In vegetable physiology too, it is unquestioned that plants receive their nourishment, either in a gaseous form, by absorbing it through the leaves, or by imbibing it in a liquid state, through the minute spongeoles which terminate the roots. From all which facts, viz: its quality (i. e. the carbonate of lime) of solidifying the moisture it absorbs[†]—the absurdity of expecting a mechanical effect from the small quantity sown over the surface, its insolubility, and the impossibility of any substance acting directly as a *pabulum*, or by stimulating and exciting the digestive organs of the plant, which is not soluble, it follows that the carbonate of lime can exercise no influence upon vegetation, unless put upon the soil in such quantities as to change its constitution by mechanical division. Such is the conclusion to which the lights of science would seem to lead us. In opposition to which, we have the fact before us, whichever way we turn, that the springs which rise in, and the streams which flow through that country, the soil of which affords, upon analysis, no lime, are strongly impregnated with it, and deposite it in the form of argillaceous marl wherever the stream is small, and exposed by ripples to the action of the atmosphere. Even those immense parapets of *travertin* in the neighborhood of the Sweet Springs, which excited the amazement of our U. States Geologist, Mr. Featherstonhaugh, and which he seemed to consider, in his communication to you, as almost anomalous, but which are by no means uncommon, are the undoubted deposites from the streams in their vicinity, which must have imbibed their calcareous qualities somehow or other, from the soil through which it percolates in forming springs. This would seem to say lime was a constituent of the soil, and without question exhibits it in a dissolved condition. Whether in the secret laboratory of nature it undergoes modifications, we cannot detect, or how it happens, it is impossible to say; but so it is*. Other facts opposed to the *scientific* theory of lime, are afforded by the interesting communication alluded to in the first part of this letter, respecting the plaster beds of Chillenango, Phelpstown, Wheatland and Cayuga, in New York, in connection with the experiments which have been recently made upon the calcareous rock taken from Moore's well; facts which, if true, involve a contradiction, while they confirm the impression in this neighborhood, that the rotten limestone is as efficacious as plaster.

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[*] The *carbonate* of lime—the form, which is presented in limestone—was found to be almost always absent, in such cases as are above named—and such was the novel and strange fact stated in the Essay on Calcareous Manures. But *lime*, in some other combination than the carbonate, was supposed to be always present in soils touching limestone.—See pp. 20, 21, 2d Ed. ED. FAR. REG.

[†] Water is not *solidified*, when absorbed from the atmosphere, either by pulverized carbonate of lime, or gypsum not calcined—as any so absorbed is not chemically combined with either. The power of absorbing water, in both, is by such action as any pulverized matter would exert, and is but feeble, compared to some other earths, or mixtures of earth with putrescent matter. But pure or quick lime, combines chemically with a certain and a considerable proportion of water, in slaking, and solidifies it, as the slaked lime may be as *dry* as any thing can be, and yet hold this large proportion of water. All gypsum is already supplied with its solidified water—it forming one of its uniform component parts. This water is dispelled by calcination, and would be again absorbed (and in that case solidified) if the calcined gypsum was scattered on the surface of the earth. ED.

Your New York correspondent calls upon you to clear away the fog which surrounds him and his fellow citizens on this subject. With equal propriety, may we of Botetourt call for aid in this truly perplexing matter—not only perplexing, but deeply interesting; for, if it be true, as your correspondent suggests, "that the mechanical operation of grinding or pulverizing crude or unburnt limestone, renders it equally fertile with gypsum," the benefits which will flow to this country, from its discovery, can scarcely be estimated.

W. M. PEYTON.

P. S. Since writing the above, I have received your 4th No., and find that the opinion of your New York correspondent respecting the rock from Moore's well, is confirmed by the analysis of Professor Silliman. I am surprised that the singularity and importance of the circumstances connected with his experiment, did not attract his attention. He has left us, from our confidence in his skill and science, in a most inextricable labyrinth. He suffers the anomalous character claimed for it to pass without comment; and proves, by analysis, that it is not only a mere carbonate, but that it contains only 50 per cent. of lime, the residue being an aluminous residuum, without the least plaster of Paris. I hope the remarks in your 4th No. will meet his eye, and induce him to investigate and treat the subject with that fulness and perspicuity for which his abilities and science so eminently qualify him†.

W. M. P.

August 7th, 1836.

PROCEEDINGS OF THE MINERALOGICAL SOCIETY OF VIRGINIA.

To the Editor of the Farmers' Register.

By order of the Mineralogical Society of Virginia, I send you the enclosed extracts from its minutes, respectfully requesting that they may be published in the Register.

Most respectfully
your most obt. &c.
W. S. MORTON, *Sec.*

August 16th, 1836.

At a meeting of several gentlemen, held at Prince Edward Court House, on Saturday, July 23d 1836, for the purposes hereinafter mentioned, Dr. W. B. Smith was appointed Chairman, and Dr. B. F. Wilson Secretary.

The objects of this meeting were, to consider, what measures are most likely to develope an intimate and extensive knowledge of the mineral wealth of the state of Virginia, and to put into operation such means as may tend to render those resources available to the purposes of public good.

Every day adds its testimony to the great amount of the mineral wealth of this state, both in the precious metals, and also in those which are more common, but not the less valuable—as coal, iron and copper. In all sections, there are abundant indications of the presence of rich ores, which were either formed *in situ*, or rolled from the highlands by water courses. The discovery of gold is an example, and the careless but profitable manner in which mining operations for obtaining it are conducted, is an earnest of the value of a more rigid and accurate survey. All over the country, the inhabitants are continually finding various mineral specimens, upon their own estates, and for want of that species of knowledge, requisite for determining the composition and value of such specimens, they are thrown aside and forgotten, or only referred to as matters of curiosity. There is no kind of institution in existence, where such minerals might undergo a faithful chemical analysis, and the owners of the lands on which they are found, informed of their real worth.

Geological surveys are for the purpose of defining the great and more striking features of the structure of a country. Operating over a large extent of surface, they are necessarily of too superficial a character to be of benefit to private persons, and the owners of smaller estates. Nor is it possible, however high may be the scientific acquirements of those who conduct them, that they should become acquainted with all the minor features of the mineralogy of a district, a knowledge which however is of the greatest interest to individuals. To obtain an enlarged, and at the same time, a very intimate knowledge of this kind, every citizen must become his own geologist—he must collect the minerals in his own neighborhood—annex to them a clear and distinct account of the circumstances under which they are found, or their locality. And the *next point* is, to have them identified, or chemically analyzed, and their value ascertained.

This important *point* fell under the consideration of the meeting. Analytical chemistry, which is the science furnishing the knowledge necessary, is not taught as a branch of education in any of the public institutions of the United States, and those persons who are acquainted with it, have almost entirely obtained their knowledge of it, in foreign countries. The number of such, of course, is very limited, and totally inadequate to the demand. The meeting therefore was fully impressed with the high importance, to the public, of providing ample instruction, by the immediate establishment of a school of chemical analysis, assaying of metals, and all those operations which are concerned in the determination of the value of minerals and ores.

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* The carbonate of lime is indeed, as stated by our correspondent, insoluble in *water*—but *is soluble* in water impregnated with carbonic acid. Besides the various other natural means of carbonic acid being given to earth and water, all rain water contains some, as it falls to the earth—and therefore, there are abundant means thus furnished, by which carbonate of lime, (then become the super-carbonate, by being combined with excess of carbonic acid,) may be dissolved, and held in solution in water. It is in this state that all limestone water holds lime. And when the excess of carbonic acid is expelled, (as is easily done,) by heat, or by exposure to the atmosphere—which last occurs mostly at the water-falls and ripples—then the lime, restored to the state of carbonate, being insoluble, is precipitated, and forms a deposite of soft limestone, or *travertin*.

† We concur heartily in the wish of our correspondent to obtain light from this abundant source. As the matter now stands, with Professor Silliman's statements of the analysis of the earth in question, the facts are incomprehensible—and would be to us incredible, except for the supposition that there are causes of action not yet discovered. Ed.

The prospects of encouragement for such a school are not small, because its utility is apparent. With the more opulent classes, the acquisition of these arts would be sought, for purposes of private benefit, and those who might wish to pursue them as a profession, would be induced by the certainty of a very lucrative occupation. In all parts of the United States, there are abundant openings for the enterprise of men who are thoroughly acquainted with mineralogy and chemical analysis, and at present, from the Atlantic to beyond the Mississippi, they would meet with no kind of competition; an assertion that can be made of no other profession. The public benefit too, which must accrue from the general pursuit of these investigations as a livelihood, will far exceed that which results from labors of a few solitary scientific men, who carry them on, only as a transient occupation. In other countries, they have been of immense benefit, and scientific chemists of the highest reputation, have been brought up in these institutions. And, if these things have happened in Sweden and Germany and other parts of Europe, where these schools have been publicly encouraged, and the mineral resources of those countries thus conducted in a flourishing and profitable manner, why should not the same happen in America?

It is hoped by the establishment of a school in which all subjects in any manner connected with mineralogy are taught, and especially practical instruction afforded in chemical analysis, that arrangements might shortly be made, for a systematical analysis of the Virginia minerals. Gentlemen residing at a distance, and finding specimens on their estates, might have authentic information of their composition, furnished from the labors of the pupils of this school.

With reference to the pupils themselves, no one, of course, without some previous knowledge of the general principles of scientific chemistry, would be able to commence in this department. Graduates of respectable colleges, and those who had attended full courses of lectures, would find their acquirements, in this particular, sufficient as a commencement. To make provision, however, for such as might be desirous of entering the school without any previous preparation, suitable arrangements could be made, by which that amount of preliminary knowledge might be acquired at Hampden Sidney College.

To that extensive portion of the community engaged in agricultural operations, the establishment of a school of this kind, holds out many advantages. The planter and farmer, from the nature of their daily pursuits, have abundant opportunities of acquiring a very intimate local acquaintance with the rarer minerals, on their own estates as well as those of more common occurrence. To instruct such, in the mode of ascertaining the composition and value of such specimens, is to give them a source, not only of pleasant recreation, but also, occasionally, of pecuniary profit.

Being impressed with the importance of this subject, the meeting proceeded to organize itself into a society, to be known by the name and title of the Mineralogical Society of Virginia. A constitution was adopted, and the following gentlemen elected officers:—Richard N. Venable, Esq. President; Dr. W. B. Smith, Vice President, and W. S. Morton, Secretary.

The Society then proceeded to engage the services of John W. Draper M. D. as its chemist and mineralogist, an appointment deriving advantage from his knowledge of the geology and mining operation of South America. As a very high assurance of his acquaintance with analytical chemistry, the following note is subjoined from the celebrated Dr. Turner, Professor of Chemistry in the University of London, and author of the work which is so extensively used as a text book on chemistry, in most of the universities and colleges of the United States.

"I hereby attest that Mr. Draper assiduously attended a complete course of my lectures on Chemistry in this University during the years 1830—31, and at the close of the session gave decisive proof of the success of his exertions, by obtaining a high certificate of honors, after a full examination in writing. I know that he has likewise pursued the practical parts of chemistry, by private study, and that he is well qualified for any situation connected with the practical applications of chemistry."

B. Turner F. R. S. Lon. & Edin.
Professor of Chemistry.
(University of London.)

The Society's chemist was then directed to proceed at once with the organization of the school; and at an early opportunity, to announce to the public, the particulars.

In reference to the foregoing, we the undersigned, fully and heartily agreeing in the object and determination of this society, recommend it to the cordial encouragement of our fellow citizens.

D. S. Carroll,
Geo. H. Matthews,
Wm. A. Hughes,
Thos. S. Flournoy,
Chs. Smith,
F. N. Watkins,
Wm. I. B. Bedford,
Saml. R. Simpson,
Noble Snell,
Saml. C. Anderson,
James Madison,
Saml. Branch,
Geo. A. Baxter,
Stephen Taylor,
W. Berkeley,
Henry N. Watkins.

[The design set forth in the preceding article is highly worthy of commendation—and we earnestly hope that its results may be profitable, as they certainly will honorable, to the individuals to whose public spirit and intelligence the execution of the plan will be due. For several reasons, there is no region of Virginia, which offers more suitable ground and facilities for these efforts, than the county of Prince Edward. One most important object, and which offers every prospect of success, is a proper search for coal. A thin seam near the surface has already been found—and as this region certainly overlies part of the great coal formation, there is every reason to hope that borings sufficiently deep may reach a seam of much greater thickness and value. Such a discovery would not only exhibit a treasure on that precise location, but would indicate its far greater extent. Though the proprietor of the land first examined might derive the earliest benefit, and therefore ought to bear a large proportion of the expense of the experiment, the profitable results would be a thousand times more extensive. Besides the land holders through all the adjacent country, the Appomattox navigation interest, and especially the trading interest of the town of Petersburg, would derive most important benefits from such a discovery—and therefore the persons connected with such interests may well afford to aid the labors of the Mineralogical Society, if directed in part to this object.]

For the Farmers' Register.

ON THE EFFECTS OF LONG CONTINUED USE OF CLOVER AND GYPSUM, WITHOUT OTHER MEANS OF IMPROVEMENT.

Mr. Peyton, in his communication to the Register, for July, imputes to me error in relation to the long and continued application of gypsum, unaided by other manures. Having observed from several papers in the Register, that the writers seemed to consider gypsum a means of permanent improvement, I thought proper to state what I apprehended to be the effect on my own lands. I should be well pleased to find I had been mistaken.

Chemistry applied to agriculture, has been among the improvements of the age, and though men of science, by analysis, have discovered many of the elements of matter, I think much has escaped their searching enquiries. I am always willing to pay tribute where tribute is due, and concur with Mr. Peyton, that the world is largely indebted to Sir Humphry Davy, and the Count Chaptal, for their labors and discoveries; but I have never been satisfied with the theory of Knight, though sanctioned by the Count, that in the districts in England, where the application of gypsum has been found to be inert, that it resulted from a superabundance contained naturally in the soil. If this theory was right, I should suppose that clover, and other plants apposite to gypsum, would flourish by its power contained in the soil. From one to two bushels of gypsum has been supposed, by those who have been well practiced in its effects, to be as efficacious as any additional quantity, but I have never heard that an excess, however great, has proved deleterious. In this respect it seems to assimilate to marl. Mr. Ruffin, in his Essay on Calcareous Manures, states, as the result of experience, "that clover, red and white, will flourish on spots most injured for grain crops, by marling too heavily." Count Chaptal, who seems to have added practical experience to his theoretical speculations, asserts that gypsum acts as a condiment, or spice, to the digestive organs of plants. If his theory be true, and we receive what general experience seems to have established, that a redundancy of gypsum is in no way injurious to clover, when artificially applied, it may be reasonably inferred, that it either rejects, or throws off the superfluity. Analogy to animal economy, seems to favor this position. Medicine is useful in sickness, and food indispensible in health; but the reception of too large a quantity, instead of imparting convalescence in the one case, and vigor in the other, will lead to disease, and sometimes death; and if the organs of the plant be capable of performing this salutary operation, when an excess of gypsum is artificially applied, I can see no cause why she should not exercise the same function where an excess of the gypsum exists naturally in the soil.

Lands on the Eastern Shore of Maryland, which do not profit by the application of gypsum, as far as my observation extends, in their natural state, are least favorable to the growth of clover, red or white, or to Indian corn. They are stiff, white, clayey lands. When highly improved by putrescent manures, for a short time they will produce rich crops of red clover, but it disappears after the first cultivation, and is rarely succeeded by a growth of white; and a rich dressing by putrescent manure does not seem to bring into action any property which was dormant in the soil. If, as Mr. Ruffin alledges, a dressing of putrescent manures will restore to healthy action lands which have been surcharged with marl, the same result might be expected, when they hold a surfeit of gypsum naturally existing in the soil or artificially applied. If the reasons given by Sir Humphry Davy for the inaction of gypsum, on soils in England, apply to those of America, I doubt its correctness: nor have I entire confidence in the correctness of Count Chaptal's theory in relation to the action of gypsum on plants.* The speculation is ingenious, but I think the mystery still remains unresolved. In stating these causes of doubts, I hope to escape the charge of presumption. I say, in truth, that I am an unlearned man. My pursuits have led me into paths wide of the delightful science of natural philosophy. My opinions are the results of my own crude reflections and a very limited experience.

I find, by referring to my essay in your No. for May, that I said, as I intended to do, that though my crops of wheat were greatly diminished, that corn grew well and clover flourished; and as Mr. Peyton suggests, by a more intimate knowledge of my course of cultivation he might be able to ascertain the cause of failure, I will make a statement somewhat more minute. My farm lies on a salt water river: the soil friable, with a red clay bottom. Under a high state of improvement, it will produce from twenty to thirty bushels of wheat, and from forty to fifty of Indian corn to the acre. This I have ascertained from small portions which

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*No theory of the mode of operation of gypsum, as manure, that has yet been published, is at all satisfactory. But even though the action of gypsum may continue to be inexplicable, its *inaction* may be plausibly accounted for under certain and various circumstances. As it is well known that *only a limited quantity* can act as manure, and that any excess above that quantity would be totally inoperative, Davy's explanation of its inertness, on soils known already to possess gypsum as a natural ingredient, is amply satisfactory. On the other hand, our poorest lands, which are totally devoid both of calcareous earth and gypsum, are as little benefited by the latter. On the supposition of *oxalic acid* being present in such soils, a reason for gypsum not acting is equally clear, as we have explained at length elsewhere. See Essay on Cal. Man. pp. 92, 93, 2nd Ed. ED. FAR REG.

I have highly manured. I commenced farming by dividing into five fields. I planted one in corn, and prepared a fallow, on both of which I sowed wheat, clover seed in the spring on my fallow, and strewed plaster the two succeeding springs. I most generally prepared a fallow of one of my clover fields, two or three times perhaps of a stubble field. I had continued this course for fifteen years, and had strewed each field four times with gypsum before I began to perceive a diminution in my crop of wheat, and it attracted my particular attention. The wheat come up well, and promised a good crop in the spring; but the stalk shot up spindling, the blade died prematurely, the head was short, and the wheat defective when cut. My system had become, from long practice, easy and familiar. It was not costly. It had been very profitable, and was not lightly abandoned; but as I thought, and still think, from the proof of experience, not until the good effect of gypsum had ceased. I am drawing marl at the expense of $12 per week, and if gypsum would act on my lands, with its former effect, I should be pleased to save the cost and trouble. The experience which Mr. Peyton refers to, in Eastern Virginia, is entitled to much respect; but I do not attach much importance to that of Pennsylvania. I have a personal knowledge, that on most of the wheat-growing lands there, in addition to gypsum, they use lime liberally, and do not neglect putrescent manures; and I have understood, that in Western Virginia, in farming, Pennsylvania habits prevail; and it will be recollected, that the proposition I stated was, that a long and continued course of clover and gypsum, unaided by other manures, would prove injurious to the wheat crop.

Mr. Peyton apprehends that my doctrines are calculated to do mischief: if they be so, I have fallen into a great error. My intention was to do good. I feel a deep interest in the agricultural prosperity of the country. The old aristocracy is generally worn out, both in fortune and intellect, and I deem it most important, that a solid, substantial, and enlightened class of agriculturists should be raised up, who may serve to check the inordinate spirit of schemers, gamblers, and speculators; for it is a fact, as lamentable as true, that even in this land of liberty and equality, few men, however high their morals and intellectual faculties, can attain and exert their proper influence in society, if clogged with poverty.

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From the Shrewsbury, (Eng.) Chronicle.

IMPLEMENT FOR MILKING COWS.

We were much interested lately in attending a meeting at Withington, near Uttoxeter, of farmers and others, convened by William Blurton, Esq., of Field-hall, for the purpose of exhibiting and explaining an invention of his, for milking cows. Mr. Blurton is already known as the author of several useful inventions connected with farming and dairy pursuits: for one of which, "the swing cheese frame," he received a medal from the Society of Arts. On the present occasion, a numerous and very respectable party, from various districts of the county, and even from Shropshire and Derbyshire attended. An excellent and substantial dinner was served up soon after one o'clock, at the Sadler's Arms. Mr. Blurton presided at one table, and Mr. Hamp, of Walton-upon-Trent, at the other. After dinner, Mr. Blurton exhibited the "milking syphon," for which he has obtained a patent. It is a small metal tube, with a syphon at the lower end, and on its introduction into the teats of the cow, the milk flows freely out of the udder, without any manual labor. Mr. Blurton spoke in a very modest and becoming manner of his invention, wishing its utility to be proved by experience, rather than be taken upon the credit of his assertion; though he expressed himself rather confidently that, after a trial, most dairy farmers would prefer its use to the present method of milking by hand. Two objections, which had occurred to the minds of several, that the cows might be injured by the use of the syphon, and that its introduction might cause a constant discharge of milk, Mr. Blurton, met by saying experience had proved them to be groundless. Mr. Ritchie, a veterinarian surgeon present, gave it as his decided opinion, that cows would not be injured by the use of the syphon. Mr. Blurton's cowman was called into the room, and any gentleman was allowed to interrogate him. He answered many questions, and said that he could milk 16 or 18 cows in an hour with the syphons, and would much rather milk 16 with them than 6 without them. Several cows were afterwards milked in the yard with the syphons, and though on account of the number of persons who crowded round them, the experiment was tried under rather disadvantageous circumstances, every one appeared astonished at the easy manner in which the milk was extracted from the cows by this new process. In consequence of being disappointed by the manufacturer, Mr. Blurton was unable to supply the company with syphons: but we understood he would shortly have an ample stock of them. We do not say that every objection, or every degree of prejudice, was removed by the exhibition of the invention in actual operation; but it will now have a fair and extensive trial, which we are disposed to thing will be successful.

[The foregoing article may, perhaps, *furnish* another instance of such facts as our friend, Gideon B. Smith of Baltimore, recently communicated, and properly commented on in this journal—viz: of American inventions, which had failed to attract notice here, being re-discovered, (or possibly "pirated") in Europe, and thence introduced in this country as both new and important. We remember that the principle of this invention was announced, and many statements concerning the practice furnished in our newspapers, years ago. It was then stated to be due to a Yankee boy, who used such simple tubes as bits of rye-straw would make. The operation of drawing off the milk was considered, at first, perfect, and free from all objection: but subsequently it was found that internal irritation was often produced by introducing the straws. This ill effect, however, might well be produced by the sharp or rough edges of cut or broken rye straws, and not by the smooth and rounded extremity of a metallic tube: and this change of material may serve completely to remove the former practical objection to the plan.]

COMMERCIAL REPORT.

So little business is transacted at this season of the year, that it is almost superfluous to say any thing on the subject. If intelligent country gentlemen would report the state and prospects of the crops of grain, cotton, tobacco, &c., such communications would be much more interesting than any thing relative to the present course of markets.

Our millers should now be receiving abundant supplies of wheat, but such is the deficiency of the crop, that many of them are idle, and none fully employed. The quality of the grain is such, that the Virginia millers cannot expect to sustain the high character of their flour, nor to do a profitable business. There will scarcely be any surplus for exportation to the northern and eastern states, if indeed there be sufficient wheat to serve the demand at home, and furnish seed for the next crop. Such a failure has, probably, never before occurred.

In the western states, and particularly in those north of the Ohio, the wheat crop is said to be good. The price of western flour in New York is, $7 a 7½ per bbl., and engagements to some extent have been made for future deliveries of flour in N. York, at about these rates. In Richmond, a contract for city mill flour is reported to be made at $8½, and in Petersburg, the little good new flour that has been ground, commanded $9 for home use. The price of wheat ranges so widely, according to quality, that it can scarcely be quoted. The best, which in ordinary seasons would be considered scarcely merchantable, commands $1 50 per bushel, and a very small portion reaches this standard. The importation of wheat from Europe, during the present year, may be computed at a million of bushels, and large supplies are expected in the next two months.

Tobacco has declined materially during the present month, and is now 15 to 25 per cent lower than it was a few weeks ago, particularly the inferior sorts. The total quantity inspected in Virginia, is less than last year, and shipments to Europe go forward slowly. Prices may now be quoted $4 to 9, not embracing the extremes. There is a prospect of a large and fine crop of the present year's growth, and a great excess in the western states. So that low prices may be anticipated during the next season.

The receipts of cotton have almost ceased, and the stock in the U. States is now reduced to nearly its minimum quantity. All markets have recently been dull, without any considerable variation in price. In Petersburg, 14 to 17½ cents have been paid, and the extremes in the large markets are 12½ to 21 cents. The prospect of the growing crop is reported to be not very favorable, save in Tennessee, and the extent of it will much depend on the continuance of warm weather during the next two months.

Considerable pressure for money has continued to prevail in the northern cities, and most descriptions of stocks are low. Exchange on England 7½.

X.

August 23, 1836.

WHEAT OF THE LAST CROP GENERALLY UNSAFE FOR SEED.

It is now manifest to all that the unfavorable opinions of the wheat crop, which we expressed in the two last Nos. were not mistaken or exaggerated, as probably most readers then supposed them to be. The quality of the grain, throughout the Atlantic States, is as defective as the quantity. It is generally shrivelled and very light, and will yield but little flour, and that of inferior quality. The few exceptions that exist, either in entire crops or parts of crops, in which the grain is of much better quality, are in cases of earlier ripening, or of some other cause, having prevented some of the great exposure to wet weather, when in the growing state. But the very small proportion of the whole crop that has thus partially escaped the general injury, would not suffice to furnish good seed to the country requiring it, even if all could be used for that purpose: and it will *not* be sold for seed, to much extent, because the great demand for good flour will cause almost every farmer, who has some good or middling wheat, to sell all except his own seed to the miller, as the most ready and profitable purchaser. We all know how inconvenient and unsatisfactory in general, to both parties, are purchases of seed wheat—and every farmer endeavors, as much as possible, to avoid being either buyer or seller of seed, to any considerable extent. If these objections exist when crops are generally good, they are magnified an hundred fold when so little grain can be had that is worth using for seed. There is then, by the failure of the last crop, a new and alarming evil, in the want of good seed for the next: and this evil is of enough importance, not only to affect the interest of numerous individual producers of the crop, but the consumers, and the public. The evil which we fear and expect is not so much the great cost and difficulty of obtaining good seed, but in the loss of crop that will be caused by trusting to bad seed.

It is true that wheat and other seeds which are much shrivelled, or otherwise of very base quality, will sprout and grow, and their produce *may be* perfect and well matured. It is one of the many laws of the Creator, in which a benevolent and preserving care is manifestly and wonderfully exhibited, that the germinating power is the last to be destroyed by causes that injure seeds. When they have been gathered so green, or have been exposed to such other disasters as to be good for nothing else, seeds will yet serve to continue their kinds in future growths. The moth-weevil that eats the inside of the grain of wheat until, apparently, nothing is left but the empty skin, still avoids the sprout, and leaves to it a power, however feeble, of producing a living plant. But though the preservation and continuance of the species is thus well provided for, it is a dangerous error to suppose (as many practical farmers still do, as well as mere theorists have done,) that if seed will *sprout*, it is sufficient for it to produce a good crop. The whole interior substance of seeds, serves for the first nutriment of the young plant, and is converted into a kind of milky fluid, for that purpose—and no other kind of food for plants, however rich and abundant, will serve as a substitute for this, during the early stages of growth. Compared to spring-sowed seeds, wheat remains very long in what may be called the first stage of growth—and therefore, can still less dispense with the store of its first and proper food which nature has provided in the grain itself. The want of this food would be severely felt even on the richest soils—and far more so on the poor.

What then is to be done in the present very general deficiency of grain fit to be trusted as seed?

No complete remedy, for the country at large, can be found. Good seed wheat, not mixed with seeds of weeds, is always difficult to obtain—and still more by orders sent to distant places; and when brought in vessels, and of course in large bulks, heating could scarcely be avoided to such extent as would impair the value of seed. These dangers, still more than the high price, will forbid importations of seed from Europe, or from the north-western states, where the crops are good. Still, in some particular cases, one or both these means of supply may be advantageously used.

We advise our brother farmers, to buy *good seed*, if possible to obtain such of their neighbors, at almost any price, rather than to sow very bad seed. If none can be bought that is materially better than what the farmer has made, his next best course is to separate for seed the heaviest and most perfect grains of his entire crop, by repeated and very hard fanning. One twentieth, or one tenth, of a very bad crop, thus selected, may furnish tolerable seed; and the labor required, and the injury caused to the sample of the remainder of the crop, left for sale, will be of but little moment, compared to the value secured in the next crop.

The next palliative is to be *sparing of seed*: not by sowing any land too thinly—but by sowing no more land than is well worth being put in wheat. Those farmers whose land, or whose locality, causes the wheat crop to be generally of little (if any) profit, would do well to abandon the crop entirely. There is always much more land put in wheat than ought to be: and many farmers will be profited ultimately by this most disastrous season, if the loss now sustained should teach them that wheat is not their proper market crop. Lime in some form, and to a certain though very moderate amount, is required to produce wheat: and when a soil is supplied with very little more than the minimum of lime absolutely requisite for wheat, the growth will always be very precarious, and will seldom, and only in good seasons, return any clear profit. On good soils, supplied by nature with this valuable ingredient, (in some form,) and on the worst soils, which may be supplied with calcareous matter by the industry of man, wheat will always be one of the most valuable crops of our country. On lands naturally poor, (and still more if sandy,) and to which lime will not, or cannot be applied, the sooner wheat is abandoned the better.

THE SEASON AND STATE OF CROPS.

Though there has been some suffering from drought at particular times, the season has continued to be remarkable for the quantity of rain. Corn on high land is better than an average crop—and much worse on lowgrounds. The rich and extensive lowgrounds on the Roanoke, on which the corn was all destroyed by freshets, have been again planted, as late as in July. The new growth is good—and promises a large product for such late planting, unless cut off by early frosts. Even half a crop upon such an extensive body of very fertile land, must have considerable effect on the profits of that region of country, and on the general supply of the corn markets of Virginia and North Carolina. Tobacco is of average growth—and the quantity made in Virginia, will be unusually large, owing to the circumstance that the high price has caused a great increase of the extent of land usually cultivated in that crop. Cotton is of good growth, but is backward, and the entire crop can scarcely mature well on any land in Virginia.

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IMPROVED CATTLE.

THE subscriber, living near Stevensville, King & Queen county, offers for sale the following calves of the improved breed, viz:

SIR ANDREW, a seven-eighths bred bull calf, born 17th February, 1836. He is six-eighths Durham, and one-eighth Devon, red and white—price, $50.

VICTOR, a full-blood bull calf, born 13th June, 1836. He is three-quarter Durham, and one-quarter Devon, white with red spots—price, $75.

CHAMPION, a five-eighths bred bull calf, half Durham, born June 13th, 1836. He is red and white—price $20.

INDEPENDENCE, a thorough bred bull calf, half Durham and half Devon, born July 3d, 1836, white with red spots—price $75.

These are all very fine calves, and according to testimonials of Col. John H. Powell, the celebrated breeder near Philadelphia, the thorough-bred Durham bulls, Comet and Frolic, the grandsire and sire of these calves, are of the best breed. If Independence and Victor belonged to Col. Powell, each would command $200, and Sir Andrew $100 or more.

I have also for sale, MAGNUS, a fifteen-sixteenths bred bull, being three-quarter Durham and three-sixteenths Devon. He is sixteen months old, but his mother having died in three days after his birth, he (though a fine animal) is not so large as he would have been. I will, therefore, take $40, half price, for him. Letters directed to Stevensville, King & Queen county, will be attended to by

JAMES C. ROY.

August 20th, 1836.—1t.

FOR SALE,

PRESTON, a splendid young Durham Short-Horn Bull, of full blood, two years old in June last, of fine size, elegant form, and much admired color, (a red roan.) His sire is the celebrated imported bull Bolivar, now the property of Gen. Peyton, of Richmond. His dam by Champion, g. dam by Comet, &c. Also several beautiful animals of the half breed. All of which will be sold on accommodating terms, if application be made to me at Orange Courthouse, within the present month.

JOHN H. LEE.

TERMS OF ADVERTISING ON THE COVER, OR ADVERTISING SHEET, OF THE FARMERS' REGISTER.

For twelve lines across the page, $1 for the first insertion, and seventy-five cts. for each continuance. Any less space will be charged as twelve lines.

A deduction of one-fourth will be made from the foregoing prices whenever a payment of $5 or more is made in advance for one or more advertisements ordered. Notes or checks of either of the Virginia banks required in payment, if sent by mail, or such others as may not be under par in Virginia; and postage must be paid on all orders through the mail respecting advertisements.

Advertisements not marked for a certain number of insertions, will be continued till forbidden—unless discontinued at the choice of the editor.

No advertisement will be inserted unless either paid for in advance, or accompanied by a satisfactory order for payment on some responsible person in Petersburg or Richmond.

For those persons who especially desire their advertisements to be noticed by many of the most intelligent members of the agricultural interest in Virginia and the adjacent states, and by country merchants, there is no one medium of communication preferable to this publication. The Farmers' Register is received at the store of almost every country merchant in the eastern half of Virginia, and at many elsewhere, in this and other States.

CLOVER SEED, WAGONS, PLOUGHS, GROCERIES, &c.—250 Bushels Sapling and Mountain Clover Seed. Timothy, Burnet, Orchard Grass and Herds Grass Seed. Very Superior one and two-Horse Northern Wagons; Ploughs from several of the most approved Factories. Sugar, Coffee, Molasses, Tea, Preserved Ginger, Candles, Paints and Oils, Lime, Tar, Salt, Iron of every description. 50 casks of Pure Wine; Best Segars; Soal, Upper, and Harness Leather; Iron and Brass Bound Buckets and Tubs; 150 tons best French Plaster, (part in the rock) Cooking Stoves; Seine Twine; Blankets; Cassinetts;—And a general assortment of Crockery, Hardware and Cutlery, &c. &c.—Now receiving and for sale by

READ, WOMACK & CO.

Farmville, Nov. 1, 1835.—12*t.*

CAMP & POPE,

COACH-MAKERS, Bank Street, Petersburg, Va., (nearly opposite the Virginia Bank,) have now on hand a large assortment of ready made *Coachees, Barouches, Razees, Double and Single Gigs;* and will endeavor to keep a general assortment of all articles in their line. All orders in their line of business, will be thankfully received and promptly attended to. Repairing of all kinds done at the shortest notice, and on the most reasonable terms.

August 1, 1836.

PRICES CURRENT.

AUGUST 26, 1836.

PRICES OF STOCKS.	Par value.	Offered.	Asked.	Last sales.	Last dividend for 6 months.
BANK—Virginia—per share, - -	100			118½	4½
Farmers', - - - -	100			116	4
RAIL ROAD*—Petersburg and Roanoke,	100	116	118	115	5
Portsmouth and Roanoke,	50				Unfinished
Chesterfield, ($53 of capital refunded,) - -	100		no sales		
Richmond & Fredericksburg,	100		110		Unfinished
Greensville & Roanoke,	100	111	113	112	do.
Raleigh and Gaston, -	100		100	98½	do.
Richmond and Petersburg,	100			102	do.
MANUFACTURING COMPANIES.*					
Petersburg Cotton Manufactory, - -	100			114	8
Merchants' Do. old stock, -	100	150			12
Do Do. new stock, -	100	125			Unfinished
Matoaca Do. - - - - -	100	120			New
Richmond - - - -					
Manchester Do. - - - -					
Franklin (Paper Do.) Richmond, -	100	90	no sales		
INSURANCE COMPANIES.					
Richmond Marine - - - - -	100				
Petersburg, Fire and Marine, - -	100	104		105	9

EXCHANGE on England, - - - - - 8¼ per cent.

COUNTRY PRODUCE.

Wheat, red,† - - - -	$1 25 to 1 50	Tobacco, - - - - -	$3 50 to 10 00
white,† - - - -	1 40 to 1 75	Cotton, - - - - - -	0 14 to 0 16½
Flour, superfine (country,) old	7 25 to 7 50	Bacon, (hog round) per lb. Western, - - - - - -	12½
Do. do. new,	8 25 to 8 50	Do. do. - Virginia,	14
Corn per bushel, - - - -	0 80		

---

* The prices of rail road and factory stocks are generally nominal. The scarcity of money (as stated in the Commercial Report, p. 319) forbids purchases at fair prices, and few holders are willing to sell for less. The few recent sales stated above at reduced prices, were made under peculiar circumstances, and furnish no correct indication of the estimated and acknowledged value of the stocks.

† Red wheat, of ordinary quality for this season, and weighing 53 lbs., sold lately at $1 35 per bushel (of 60 lbs.)—and very good white, weighing 61, sold on the 24th, at $1 75. Both parcels were bought for Petersburg Mills, and received on James River, off the farms where made.

TO CORRESPONDENTS AND READERS.

Communications on hand—*On the habits of the Hessian Fly—On the Rail Roads of North Carolina—The Respectability of labor.*

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For the purpose of furnishing complete sets to new subscribers, I will pay $5 each for copies of Vol. I. Farmers' Register, if complete, (with title-page, index, and list of subscribers,) and not materially defaced. If without the index and list of subscribers, $4.50 will be paid for the 12 numbers.

For any of the first 9 numbers of Vol. I., 50 cents each, will be paid—or (if preferred by the person offering them,) given in exchange for the whole nine, a complete copy of Vol. II., together with a copy of the Essay on Calcareous Manures. Of Nos. 10, 11, and 12, of Vol. I., the impression was increased, and they can be furnished at subscription price, to any who may desire to have them.

Complete and clean copies of the title-page and index of Vol. I., will be bought at 25 cents.

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EDMUND RUFFIN.

THE
FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the improvement of the Practice,

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

VOL. IV. OCTOBER, 1836. No. 6.

And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." *Swift.*

PETERSBURG, VA.
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1836.

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COACH-MAKERS, Bank Street, Petersburg, Va. (nearly opposite the Virginia Bank,) have now on hand a large assortment of ready made *Coachees*, *Barouches*, *Razees*, *Double and Single Gigs;* and will endeavor to keep a general assortment of all articles in their line. All orders in their line of business, will be thankfully received and promptly attended to. Repairing of all kinds done at the shortest notice, and on the most reasonable terms. *August* 1, 1836.

THE FARMERS' REGISTER.

Vol. IV. OCTOBER, 1836. No. 6.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

From the Farmer's Series of the Library of Useful Knowledge.

BONES AS MANURE.

Bones, although of comparatively late introduction as manure, have yet occupied so much of farming attention within these few years, that we have no hesitation in placing them at the head of those miscellaneous substances which are usually employed for that purpose. They have indeed been used in some parts of England for a long time, and have been extensively imported from the Continent into the town of Hull, where several machines have been erected either for grinding them into powder, or bruising them into small pieces; which modes of application have been found so advantageous, that they have, within the last twenty years, excited general attention, and are now in almost universal use as the principal manure for raising turnip crops on the calcareous soils in Yorkshire and Lincolnshire. It is upon this description of land that they are the most decidedly valuable, and the testimony of some farmers of experience, proves that to mix them with a portion of vegetable or coal ashes, is a profitable application for the production of turnips; as, by this method, the vegetation of the seed is quickened, and the young plant, getting rapidly into rough leaf, thus escapes the fly.

Long before the great advantage which may be derived from ground or well-crushed bones was generally known, many persons were aware of their fertilizing properties. To render them available, however, the wasteful and injurious process of reducing them into ashes by fire was then commonly resorted to; by which, indeed, a certain degree of benefit was imparted to land upon which sulphate of lime or gypsum will have effect, but could not be so effectual, in point of nourishment, as bone in an uncalcined state, because the oil and other nutritive matter which it contains is thus dissipated. In other instances, they were either reduced by lime, or laid at the bottom of the farmyard, and decomposed by the effect of urine, and in some cases were partially broken by the hammer. In these modes, however, great quantities were wasted, which is now prevented by the improved method of preparing them by machinery: it is therefore useless to enter further into the details of practice which has become obsolete.

When reduced to powder, the bones alone are ground, being divested by the process of boiling, not only of every particle of flesh, but also of a material portion of oil which is also extracted; and it is only in that state that they can be brought to the condition of fine powder. In this state, it is only reasonable to suppose that they cannot be so beneficial to the land as when fresh and unboiled; yet we find, by the report of the Doncaster Association "on bone manure,"—to which we shall presently refer—that they have been found more effectual after having passed through the manufactories. When not ground completely into powder, they are, however, broken in the machines, by cast-iron rollers, formed with deeply indented rims, by which they are first partially bruised, and then falling down upon other sets of rollers, each with the teeth more closely fixed, they are in this manner reduced to various sizes, from one inch to half an inch in thickness, and a considerable quantity of coarse dust is also procured by the process. These bones are usually sold under the respective designations of inch, three-quarters inch, half-inch, or dust; but the greatest demand is for those of the half-inch size, which contain all the dust which has been formed in crushing them. The "dust" is collected in great measure by ridding the inch and three-quarters inch bones.

When the bones are not boiled, each pair of rollers is furnished with a set of malleable iron scrapers attached below, in order to clear the teeth of any animal matter which may adhere to them, and thus the oily substance contained in the bones is saved*. As bone-mills have been now very generally erected, there are few parts of the country where the manure cannot be procured in a prepared state; but when the bones are only to be had raw, and it is an object with the farmer to reduce them to a small size, they can be easily broken to pieces by his own laborers. Several farmers have indeed erected small machines with two cylinders of cast-iron, with teeth, which lock into each other, by which they are broken into small pieces. The price at the mills varies, of course, according to the trouble of preparation, the distance of carriage, for grinding, and the demand; but commonly averages, for the dust, from 2*s.* 6*d.* to 3*s.*, and in some late instances even 3*s.* 6*d.* have beed paid—for pieces, from 2*s.* to 2*s.* 3*d.*, according to size—and 1*s.* 10*d.* for rough bones, per imperial bushel. No allowance appears to be generally made by the dealers on those which have gone through the process of boiling.

The expense of bones purchased in the rough state, and broken on the farm, is thus stated as an actual charge incurred per acre—

24 cwt. bones, prime cost - -	£2	3	2
Carriage of ditto, 7 miles - -	0	7	0
6½ days, man breaking bones, at 1s. 10*d.* - - - - - - - -	0	11	11
3½ do. a girl spreading do. on the drills - - - - - - - - -	0	2	11
	£3	5	0

Experiments.

Their effects will be best seen by the following trials:

On the estate of Garrowby, on the Yorkshire Wolds, belonging to Sir Francis Wood, the crops of turnips had dwindled to nothing, and the fallows, though tolerably manured, were covered only with common hemp, nettle, and other weeds, instead of turnip plants; but by the use of twelve

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* See the Prize Essays of the Highland Society, for a detailed description, accompanied with plates of a very complete mill for crushing bones, erected by Mr. Anderson of Dundee.—N. S., vol. i. p. 301. Ibid. p. 73.

[illegible] of bone-dust in drills, the turnip crops have become excellent, and the following crops are very considerably improved[*].

At Clumber Park, the seat of the Duke of Newcastle, in Nottinghamshire, 600 bushels of small bones were, in 1822, spread upon 24 acres of grass land, in the dairy farm, consisting of dry, sandy, and gravelly soil, which had been laid down about ten years. Their effect upon the pasture improved the condition of the cows so materially, that about twice the quantity of butter was made from them than from cows grazed upon land of similar quality, but not boned; and this effect, it is said still continues[†].

Twenty-five bushels of bruised bones, per Scotch acre, having been applied by Mr. Watson, of Keillor, near Cupar Angus, to Aberdeen yellow turnips, on some sharp black land, brought them above ground on the third day, and into rough leaf on the tenth; on the fifteenth, they were fit to be thinned out; while farm-yard manure, though applied to the same soil, at the rate of twenty-five cart-loads per acre, did not bring them up till the fifth day, nor render them fit for the hoe until the twentieth. They in this manner manifested the same superiority until the month of September, when the weather having set in dry, it was expected that the crop would cease growing; which was the case with that part which had been dunged, but the bone turnips continued to grow vigorously, and upon a comparative trial in the middle of October, their produce exceeded those which were dunged, by six tons per acre: twenty-eight tons to twenty-two[‡].

On some land, the quality of which is not stated, crushed bones were laid by Mr. Falla, of Gateshead, near Newcastle-upon-Tyne, at the rate of 100 bushels per acre; the rest of the field being manured with well-rotted stable-dung, at the rate of fifteen two-horse cart-loads per acre; that part which was boned was superior to some parts of the dunged ground, and fully equal to the rest[§].

Mr. Graburn, of Barton, in Lincolnshire, has manured with crushed bones, at the rate of thirty bushels, and with dung at eight loads per acre, for turnips, after which the turnips were much later than the rest. On the second year of seeds, after the turnips, he covered the dunged part with yard manure a second time, and two years afterwards, a third time; then sowed the land with wheat, and the boned ground produced rather a better crop than that which had been thus thrice dunged[||].

During the dry summer of 1826, thirty-four acres of a siliceous sandy soil, on the estate of Sir Charles Throckmorton, at Buckland, in Oxfordshire, half of which had been manured with farm-yard manure, and the remainder with bones. The whole was sown with turnips, drilled in the Northumberland fashion; and that portion on which the bones were laid presented a remarkably fine crop, nearly a fourth part advanced in bulb about the latter end of August, while that part which had been dunged was merely getting into leaf. The experiment was repeated in 1827, on green-globe turnip, sown on the 20th of July, upon similar land, with the same superiority in favor of the bones: the succeeding crop of barley also produced five bushels per acre more than that which followed the dunged turnips, and the cover was also heavier[*].

The Honorable Captain Ogilvie, of Airlie Castle, has also applied bone dust, at the rate of 15 and 20 bushels per acre, to a light sandy loam, with a subsoil of gravel and sand, coming in some places nearly to the surface; and after the experience of five years upon a series of trials commenced in 1827, he found all the successive crops of turnips, barley, and grass-seeds so decidedly superior to those which had been previously produced by other manure, that the Highland Society last year awarded their honorary silver medal to his Report.

To these facts in favor of bone manure, others must, however, be also stated of an opposite tendency, particularly when placed in opposition to farm-yard manure, to which we wish to call especial attention in comparison with bones, as being at the command of every farmer.

On the estate of Mr. Evans, jun., of Dean House, also in the county of Oxford, bones were tried for the wheat crop upon calcareous stony land, in comparison with stable-yard manure; but the dung had so greatly the advantage, that the bone crop appeared but little if any degree better than that on soil without any manure whatever.[†]

On the lands of Mr. Hawden, in Kincardineshire, turnips were sown in the month of June, on various soils, in drills laid off at 27 inches apart: the manure was laid on in single Scotch acres; and the produce of the roots, exclusive of tops, accurately weighed, as follows:—

On a mixture of stiff clay and gravel,					
12 tons of farm-yard manure	produced	26	tons	8	cwt.
1½ „ bone-dust	„	23	„	12	„
On a soft sandy soil, naturally inclined to moor,					
16 tons of farm-yard manure	produced	29	tons	12	cwt.
1¼ „ bone-dust	„	24	„	16	„
On a sandy light soil, sown the following year,					
16 tons of farm-yard manure	produced	25	tons	16	cwt.
1 „ bone-dust	„	23	„	18	„
10 cwt, horn-shavings, mixed with 1 cart-load of hen-dung and 9 ditto coal-ashes	„	20	„	6	„

It is also remarkable, that although three of the drills were spread unmixed with the horn-shavings, which are considered as a more powerful manure than bone, yet they only produced at the rate of 2 tons 13 cwt. per acre.[‡]

On Mr. Boswell's farm of Kingcaussie, in Kincardineshire, two acres of Norfolk globe turnips were drilled upon poor high ground, reclaimed from moor, and

20 cart-loads, or tons, of dung	produced	32	tons	14	cwt.
1¼ ton of bones	„	28	„	13	„

On the same farm, in another year, the season of 1824 being cold and wet operated very much against the turnips which were manured with bones; but in that of 1822, those raised with bones and stable-dung appeared to be equal.[*]

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[*] Doncaster Report, p. 6.

[†] Ibid. p. 18.

[‡] Quart. Journ. of Agric. N. S., vol. i. p. 14.

[§] Farmer's Magazine, vol. xvi. p. 330.

[||] Lincoln. Report, p. 300.

[*] Prize Essays of the Highland Society, N. S., vol. i. p. 75, communicated by Mr. G. Sinclair.

[†] Ibid. p. 77, communicated by Mr. G. Sinclair.

[‡] Prize Essays of the Highland Society, N. S., vol. i. p. 69.

Notwithstanding this evident difference against the produce obtained by bones, in point of weight it should not, however, escape remark, that the latter gentleman estimates the value of their return in money as being superior; for the cost of the two manures is, according to his calculation, as follows:—

One acre manured with farm-yard dung—		
20 cart-loads of dung, including carriage, at 10s. per load		£10 0
33 tons of turnips, at 10s. per ton		16 10
Net return		£6 10
One acre manured with bone—		
1¼ ton of bones, at 42s.	£2 12 6	
Breaking and driving ditto	0 18 0	
		3 10 6
29 tons of turnips, at 10s. per ton		14 10 0
Net return		£10 19 6

Thus leaving a difference in favor of bones of no less than £4 9s. 6d.—or what we should in this country call a tolerably fair value, if fed off, for the produce of an imperial acre: but although the price of the turnips is far beyond present rates, and the charge of dung, unless carried to a great distance, is too high, we yet leave the account as it stands, as forming a ground for similar comparative calculations.

To this may be added the following particulars of a comparative trial between stable-manure and crushed bones, lately made on the property of Sir William Maxwell, of Calderwood. The field was an old ley, consisting of strong loam, on a retentive clay bottom; but having been completely drained, as well as ploughed and cleared, under favorable circumstances, the condition of the land —from which the previous crop of oats had been taken in 1832—was perfectly satisfactory at the time of preparing it for turnips, with various species of which it was sown in the following spring; and in addition to the quantities of manure stated at foot, 7¼ chaldrons of lime were laid per Scotch acre. Where the stable-manure had been applied, the plants sprouted more rapidly and vigorously than was the case with the bones; but ultimately the latter gained ground, and, if any thing, got rather the start of the dung, and no part of the crop suffered in any degree from the fly. The most accurate calculations were made in order to ascertain the produce of the crops per acre, and the following was the result:—

Swedish,		
30 cart-loads of stable-dung per Scotch acre, poduced		29 tons.
60 bushels of crushed bones	”	24
Dale's Hybrid,		
30 cart-loads of stable-dung	”	33
60 bushels of crushed bones	”	31
45 ditto	”	29
Yellow Bullock,		
39 cart-loads of stable-dung	”	29
60 bushels of crushed bones	”	28

The quality of the soil is, however, by no means particularly well adapted for the turnip culture, partaking, as it does, rather too much of the clayey character; and although it was divested by drainage of all superfluous moisture, yet there can be little doubt that to that cause the comparatively unfavorable effect of the bones may be chiefly attributed.[*]

Effects of bone-dust and bones.

Bone-dust is the fittest state in which to lay it upon grass, for it will not only take more immediate effect upon the crop, but if laid in pieces, it would interrupt the progress of the scythe. It should, however, be recollected, that fine powder can only be obtained from spent bone which has undergone the process of manufacture. It is, therefore spread as a top-dressing, by hand; but it is also very commonly laid in the drills for turnips, for which purpose many ingenious machines have been contrived for sowing it along with the seed.[†] It is, however, much to be regretted that these implements cannot be constructed with more simplicity, for their cost is so considerable, that unless a man has a very large quantity of land to drill, their purchase would be imprudent, and the hire is generally unreasonably expensive.

Regarding the *quantity of dust*, the powdered bones are dearer than those which are merely broken small, and although said to be more forcing to the first crop, on account of their being, when in the state of powder, more intimately blended with the soil, and more directly applied to the seed, yet they are not found so durable as when they are laid on in pieces; but it is also true that, in the former case, they are not laid on so largely, for the amount depends entirely on the size of the bones. They have been applied, in the rough state, to the extent of 100 bushels per acre; but the average quantity, of all sizes, is stated, in the Doncaster Report, to be 39 bushels. When the smaller bones are distinguished from the larger, they, however, seldom appear to exceed 30 bushels per acre, and in many cases do not arrive at 20: perhaps it may be assumed, as the most general practice, that half-inch bones are employed at the rate of 25 to 30, and dust at 20 bushels per acre; but a distinction should be also drawn between the quantity of those which are applied after being manufactured, and those which are laid on in a raw state.

The size of the pieces to which the bones should be broken is also an object of some importance, as the smaller they are the more prompt will be their effect: on which, the following observation has been made by one of the correspondents of the Doncaster Association: "That if he meant to till for early profit, and if he wished to keep his land in good heart, he would use half-inch bones; and in breaking these, he should prefer some remaining considerably larger:" the reason assigned for which is, "that by using bones of a large size, with dust in them, there must be sufficient of the small particles of the dust to set the turnip crop forward, and sufficient of the large particles of the bone left to maintain the land in good condition for the last crop."

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[*] Prize Essay of the Highland Society, N. S., vol. i. p. 74.

[*] Quart. Jour. of Agric., N. S., vol. iv. p. 889.

[†] A very detailed description of one of these instruments, along with an engraving, may be found in the Quarterly Journal of Agriculture, N. S. vol. ii. p. 719. Another machine for the same purpose, but with a double hopper, for sowing two drills at one time, is also described, together with a plate, in the Prize Essays of the Highland Society of Scotland: N. S., vol. ii. p. 206.

Respecting their durability, it has been affirmed. that the effect will not be increased if they be laid on to great amount; for the same produce has been obtained from the comparative application of 50 and 100 bushels; and an experiment has been tried by varying the quantity on different ridges of a large extent of ground under turnips, at the rate of 28, 40, and larger quantities alternately, without creating any visible difference in the crop*. This, however, may be perfectly correct, so far as regards one or two crops, for it has been found that, when used in large quantities, they have rendered the land extraordinarily productive during a great length of time, of which we find the following instances in the Doncaster Report:

1. On a field, part of which was boned forty years ago, the crops were, on that part, during fifteen or sixteen succeeding years, visibly better than the remainder, although the land was all of the same quality, and the part not boned was manured with farm-yard dung.

2. In another case, about three acres of light, sandy land were dressed, in 1814, with 150 bushels of bones per acre; since which time the land is said to have never forgotten it, but is nearly as good again as the other part, farmed precisely in the same way, with the exception of the one application of bones†.

We learn, also, from experiments at Kew, that although they yield a certain supply of nourishment to plants the moment they are capable of receiving it, yet that is done so gradually as to furnish only a regular and moderate supply: reasoning upon which, it is to be presumed, that as a large quantity does not produce the effect of forcing a crop in proportion to the amount supplied, neither can it be so soon exhausted by the gradual consumption of the smaller quantity. This application may therefore be perfectly consistent with good husbandry, if applied to any amount, however large; though, as regards the farmer's purse, the expenditure of the outlay is a different question. The extent of their fertilizing quality is greater upon grass-land, under cattle, than upon arable. Valuers estimate the allowance to a quitting tenant by supposing the effect of bones upon tillage and meadow-ground to be exhausted within four years; but on grass-land depastured it is considered to last during eight.‡

Experience seems to be in favor of laying the manure in *drills*, especially when applied to turnips, although the superiority of the *broad-cast practice* is maintained by some very intelligent farmers, who hold—that the turnip plant receives its support principally from the fibres which it throws out sideways, to a much greater length than people will believe, and derives more nourishment from them than the tap-root; and that the bones being dispersed, the fibres are more likely to meet with them than when they are accumulated round a tap-root, and that method must be the best which occasions the greater quantity of nourishment to be conveyed to the body of the turnip. In drilling the bones, there is also a difficulty found in the after-ploughing, of mixing them with the soil; and although this may be in some measure obviated by cross-ploughing the ridges, yet that portion of the land on which the manure is thus laid receives more than an equal degree of benefit. A third mode is however acted upon by others, who sow them broad-cast, and gather them into ridges with a mould-plough.

The *time for laying them upon the land*, when applied to grass, whether natural or artificial, is generally recommended to be early in the spring; but if upon meadow, the growth of which has been fed off, then the moment the cattle are removed. Experience, however, varies upon this point; because it has been found to depend materially upon the season and the state of the land, which, if wet, will be more benefited by delaying the operation until the weather becomes warm and the ground dry.

When applied in the drills of arable land, they are of course deposited along the seed; but when spread broad-cast, then they are not uncommonly either harrowed in immediately previous to the sowing, or with the last ploughing; though, when used in a fresh state, without having been subjected to process of manufacture, they should always be laid in sufficiently long before the sowing, to allow them time to ferment, or they will not take immediate effect upon the rising crop.*

The *soils to which they are best adapted* are those of a light and warm nature; for on wet and cold grounds they have rarely been found to produce any sensible benefit. Their power of contributing to lighten strong land, by their mechanical action upon the soil, and thus rendering it less adhesive. has indeed been vaunted, and, if laid on a very large amount, there can be no doubt that the bones, in pieces, would have some such effect; but the smallness of the quantity in which they are usually applied renders their force for that purpose quite insignificant.

On *heavy loams and clays*, the accounts of their operation have been almost invariably unfavorable; and it may be laid down as a necessary qualification in a soil fit for the application of bones, that it should be dry. This, indeed, has been contradicted by experiments stated in the Doncaster Report, upon what is described as a wet sand soil, with an irony-colored subsoil, upon which two quarters per acre were drilled, and produced an excellent crop, when manure had been previously tried without effect. This, however, having occurred in the years 1826 and 1827, which were unusually dry, may serve to explain the fact, without affecting the principle that bone manure is not generally beneficial to clay lands.

The same Report states, "*upon very thin sandy*

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*Quart. Journal of Agric., N. S., vol. ii. p. 108.

† About sixty years ago, a farmer is also said to have obtained a forty-years' lease of a tract of poor land, in a high situation near Rochdale, in Lancashire, on which, after fencing and draining it, he erected a bone-mill, and began manuring the ground at the rate of 100 to 130 bushels of bones and dust per acre. The consequence of which was, that in a few years he let off more land than paid the rent of the whole, and retained a large farm in his own hand. The Correspondent of the Quarterly Journal of Agriculture, from whom these details are taken, says "that one acre would summer a cow of large size, and that some fields were cropped with oats ten or fifteen years in succession; yet that it is surprising to see the herbage which the land still produces, both as to quantity and quality, near one-half being white and marl clover.

‡ Report of the Committee of the Doncaster Agricultural Association, on bone-manure, p. 14.

* Doncaster Report, p. 16.

land, the value of bone-manure is not to be estimated; it is not only found to benefit the particular crop to which it is applied, but extends through the whole course of crops; and even in the succeeding courses, its effects are visible in the improved quality of the land, and the efficiency of a smaller quantity than would at first have insured a crop. Upon much of the high land about Babworth, which is a light sandy soil, the crops under ordinary farm management were comparatively unproductive; but since the introduction of bones, after having been dressed for several fallows with sixty or seventy bushels per acre, they have not only become productive, but so much improved in quality as to return an equal crop with a much lighter dressing of manure or bones throughout the next couse."

"On the *dry limestone* near Doncaster, the same favorable results have been obtained; and no failures, beyond those attributable to peculiarity of season, are noticed."

On the *Wolds of Yorkshire and Lincolnshire*, it also appears, by the testimony of several extensive farmers, that "before bones were generally used with turnip-seed, many thousand acres were annually sown for that crop without any manure whatever, from the impossibility of getting fold-manure for more than one-third or fourth of their fallows. The turnips upon such unmanured land were consequently very indifferent; and the benefit of sheep feeding upon their tops—for of bottoms they seldom had any—was very trifling. Since the use of bones has, however, become general, the turnip crop has been, in many instances, ten-fold, and in few less than four or five-fold its former bulk. All the succeeding crops of grain and seeds have been amazingly increased, and, upon the four or five-shift system, there is no doubt the land will go on progressively improving, requiring a less quantity of bones annually, from its increased fertility and power."

On *light loams*, the return on the Doncaster Committee give bones a preference to farm-yard dung. And we learn that, upon the calcareous soil of the Yorkshire Wolds, heavy crops of turnips have been raised from 16 bushels per acre of bones, while in the same field, and under similar circumstances, but manured from the farm-yard at the rate of from 8 to 10 tons per acre, the turnips have been of the most inferior description.

On *peat soils*, if previously drained and laid dry, their advantages are reported to be so striking, that from fifteen to twenty bushels of dust per acre, drilled, have been also found to very far surpass the ordinary dressing of stable-dung, and even of lime and pigeons' dung.

On *gravels*, the reports are meagre and contradictory, though perhaps reconcilable in principle, as it has been justly observed, that "a gravelly soil may embrace every variety of texture and quality, from the light dry sand to the water-logged yellow clay—preserving in each the necessary admixture of stones and grit." To wet gravel, their application has been found decidedly unfavorable.*

Analysis.

An examination of the component parts of soils, and of the power of bones, when applied to them as manure, would go far to explain the irregularity of their different effects upon various kinds of soil. Bone is known to consist of about equal parts of earthy and animal matter; the former chiefly composed of gypsum—which is of so indestructible a nature as to have been termed, by early chemists, the "earth of bones"—and a small portion of carbonate of lime; from which we may conclude that probably half the weight of bones is in the greater part consumed by plants as direct nourishment in their state of growth, and that the remainder is more gradually absorbed by the soil, as well also as by the plants; for lime, though in small amount, is always present, in greater or less quantity, in all vegetable substances.

"The quantity of earthy matter varies according to the age of the animal; and, in like manner, the quantity of animal matter varies also in proportion to the condition of the animal. In the best kinds of bones for manure, viz., those from fat young animals, perhaps the following proportions may give an approximation to the relative quantities of each in 100 parts:—

Earthy and saline matter - -	40	parts.
Cartilage and jelly - - -	40	
Fatty matter - - - -	20	

The soft parts thus form, in the best bone, about sixty, and upon an average, perhaps, amount to fifty per cent., which are almost entirely constituted of the same elements of plants, and all of them, sooner or later, liable to be dissolved and absorbed by the roots. The cartilage, indeed, when the bones have been buried in a dry situation, is very indestructible; but when exposed to the action of air, water, soil, and vegetation, probably pass into the state of jelly, and be dissolved, or otherwise decomposed, probably at the time when the fatty matter—the decomposition of which begins almost immediately—shall have been nearly exhausted."*

This analysis has been taken from an anonymous essay "on the action of ground bones on plants and soils;" the author of which observes, that "although it be granted that the composition of bones is thus well calculated to afford nourishment to plants, it must be admitted that the amount of their action as a manure still remains in a great measure unexplained. The quantity allowed per acre is not usually more than 10 or 15 cwt., of which not more than a half is efficient as manure: and this is but a small fraction of the weight which we carry off the field in vegetable produce. In these circumstances, we must either leave the matter unresolved, or have recourse to hypothetical explanation, to be confirmed or disproved by future observation." We agree with him in preferring the latter alternative, as best calculated to lead to a discovery of the truth; and as an inquiry into the cause of the different results occasioned by the specific application of bones to every species of soil would only lead us into a wide and probably fruitless discussion, we shall confine ourselves to an account of the analysis given by Mr. G. Sinclair, of the two kinds on which trials are mentioned by him to have been made in Oxfordshire.

That on the land of Sir Charles Throckmorton,

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* Doncaster Report, p. 8.

* Quart. Jour. of Agric., N. S., vol. i. p. 49

.. the bone manure had such beneficial effects, contained in 400 parts :—

Fine siliceous sand, 167 parts; calcareous sand, 43; water of absorption, 99 -	309
Decomposing animal and vegetable matter, destructible by fire - - -	24
Carbonate of lime (impalpable) - -	25
Silicia, or the pure earth of flints - -	23
Alumina, or the pure matter of clay -	9
Oxide of iron - - - - - - -	8
Soluble animal and vegetable matter principally vegetable extract, with indications of muriate of soda - -	5
Moisture and loss - - - - - -	2
	400

That on the land of Mr. Evans, jun., on which the bone manure appeared to have no beneficial effect, consisted of:—

Calcareous sand and gravel, nearly pure carbonate of lime - - -	217
Decomposing animal and vegetable matters, destructible by fire - - -	17
Carbonate of lime (impalpable) - -	39
Silicia - - - - - - - - -	85
Alumina - - - - - - - -	20
Oxide of iron - - - - - - -	5
Soluble matter, principally vegetable extract, with sulphate of lime, or gypsum	4
Moisture, or loss - - - - - -	13
	400

On which he remarks, that "the striking and essential point of difference between these two soils consists in the carbonate of lime. In the soil so much benefited by the bone manure, carbonate of lime is deficient, while in the soil so benefited by it, the carbonate of lime is almost in excess; at least, had it not been so much in the form of gravel and sand, the soil would have been what is termed cold. The differences, also, between these two soils, in the coarseness and fineness of their sand and gravel, and the superior quantity of alumina, or clay, in calcareous soil, should not be overlooked."

The quantity applied to the siliceous sandy soil, where the bones had such beneficial effects, was 36 bushels per acre, partly supplied from the dog-kennel, and partly purchased. On the calcareous soils, they were applied in a large quantity, and also in a recent state; on which Mr. S. observes, that "animal matter being so much more easily decomposed than vegetable matter, the recent bones must afford nutriment to the soil very speedily;" yet he adds, "that he has always found that both animal and vegetable matter, before they become beneficial to an immediate crop, require a first stage of decomposition, and that this degree of fermentation or decomposition is best effected before these substances are applied to the land."

This accords with the report of the Doncaster Association, in which it is said "to be acknowledged by their correspondents to be a prevalent opinion among intelligent farmers, that manufactured bones are equal in their effect to raw bones;" in proof of which they instance the following experiments :—

Twenty-four acres having been boned at the rate of 50 bushels per acre, part with bones which had the oil stewed out of them, another part with bones which were full of marrow, and a third part with horses' bones having much flesh upon them. The crop, which was turnips, was all good, but the next crop, where the fleshy bones were laid, was not so good.

Broken bones fresh from dog-kennels were spread on a newly-ploughed clover ley of high sand land, at the rate of 80 bushels per acre, and on the following day sown and harrowed in with wheat; but the crop was bad, and no advantage was observed to be derived from the bones in the succeeding crops. The same experiment was repeated upon a piece of fallow in Blyth Forest, sown with turnips, with similar results; but the same gentleman having sent bones from the dog-kennels to be broken, and then laid upon a heap, and covered with earth, in which state they remained for about a month, after which they were laid upon turnips: their good effects were visible on every yard on which they spread, being the largest and the best turnips in the field, although the other part was manured from the farm-yard, where a considerable quantity of oil-cake had been consumed.

These experiments certainly tend to confirm the fact, that fermentation is requisite to give immediate effect to bones as manure, which is only in accordance with the chemical principles applicable to all animal substances; for we all know, that although flesh, if buried in the earth, will not produce any benefit to the land until it is decomposed, yet that object once attained, its fertilizing powers are instantly brought into force; but we cannot admit that this warrants the conclusion, "that manufactured bones are equal in their effect to raw bones." They may indeed be superior on a first application; and we make no doubt that when thrown together and rendered putrid, they will become more promptly available than if they had undergone no fermentation whatever. Yet we feel persuaded, both from the nature of animal matter as manure, as well as from much inquiry regarding the practical application of bones, that when deprived by manufacture of the gelatin and oil which they contain, their improvement of the land will not be so durable as when they are laid on raw, or after fermentation when collected in a fresh state.* Many farmers are thus imposed upon by dealers; but the bones are sold to those who are aware of their real value, for much less than the price of those from which the oily substance has been extracted.

Composts.

The fermentation of bone naturally leads to the consideration of the subject of forming *a compost of bones with earth and other substances*, by a mixture with which they soon become decayed and pulverized—a practice which is stated in the Doncaster report to have been recommended by several very intelligent farmers, thirteen of whom, solely from the result of their own experience, describe its effects as superior to those of bones used singly. With some of these, it is the practice to mix 50 bushels of bones with 5 loads of burnt clay, or good earth, per acre; by which dressing, the crops between fallow and fallow, excepting clover, appear to have been increased one-fifth in value. Others use forty bushels of bones, broken from two to three inches, in a compost with five loads of farm-yard manure, and a sufficient quantity of earth, the effect of which has been felt on the wheat crop at the end of the four-course system. Many also mix up dung, root, rape-dust, and the ashes from weeds and house fires, with the bones, by which great heat, and consequent fermentation, is occasioned.

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* Besides the various modes already in use of drawing oil and spirits from bones and horn, the cotton manufacturers in Lancashire are said to have lately used a glutinous substance, extracted from bones, in the fabrication of the weft of their low-priced cloth; and there are now a number of manufactories of this newly-discovered matter.

The most general practice, however, is to form the compost entirely of bones and yard muck, mixed, in various proportions, with

From 50 bushels of bones	to 4 or 5	of dung.
20	do.	4	do.
12	do.	8	do.

This, if the heap be well covered, will no doubt decompose the bones very rapidly; and one person states, "that he has used as much as 35 bushels of bone dust, per acre, without manure, in the same field where he laid six loads of fold manure, and ten bushels of bone dust; but the turnips on the part manured with bone dust alone were not so good as those on the part manured with the compost and the succeeding crops were still worse in comparison."

As the great amount of bones now actually consumed as manure, besides the quantities applied to other purposes, may reasonably excite an apprehension that the still increasing demand will soon exceed the supply and consequently raise the price, a correspondent of the "Quarterly Journal of Agriculture,"* has suggested the following economical method of employing them, which he has used for the two last years, and by which he states that he has obtained heavy crops of turnips.

He forms a compost, as the manure for one imperial acre, of 8 bushels of coarse bone-dust, with no less than double that quantity of coal-ashes, which may be generally procured for about 5s. per ton. The ashes should be carefully collected in dry weather and placed under cover, in order that they may be kept free of moisture; or, if that be difficult, they may be strewed with a dusting of quick-lime: after which they are to be riddled as small as the dust itself, for otherwise, if sown with a drilling-machine, they will not pass easily through the hopper. The bones are then mixed with the ashes; the mass ferments, and evolves a considerable degree of heat, when they soon become fit for use.

Turnips raised with this compost, he affirms to have always possessed the same characters of a close crop, firm root, and hardiness to resist the rigors of winter, that turnips raised with bone-dust alone evince; in proof of which, he has sold them for £7 per acre, to be eaten off by sheep. He, however, supposes that it is the bone-dust alone which secures to the crop whatever nourishment may be imparted to it at the future stages of its growth, in which he is doubtless correct; but in imagining that he has thus discovered a more economical mode of their application in their effect upon succeeding crops, we imagine that his further experience will show him that he has been deceived; for although the fermentation of the bones, occasioned by the application of the ashes, may increase their power upon the actual crop, it will be proportionably diminished in those which follow, and we think that the instances which we have already stated must convince practical men that the durability of their influence upon the soil depends on the quantity in which they are applied.

Application.

Independently of the decided fertilizing properties of bones, when applied to dry and light soils, they have the great advantage of being procurable at a small expense of carriage, which diminishes the labor of teams to a great extent; for one wagon-load of 100 bushels, broken small, will in most cases be found equal to 40 cart-loads of yard manure. They are also capable of being preserved during a long time, when kept dry, without incurring damage, and thus may be stored up during the winter season, when farm business is not pressing; added to which, they leave the land freer from weeds than when it is manured with dung. This, and their suitableness to the drill husbandry, renders them peculiarly adapted to the cultivation of turnips—to which, indeed, they have been the most universally applied; and we need not remind our readers, that on the success of that crop generally depends those of the whole succeeding course. The instances are also numerous, upon all soils, of turnips being destroyed by the fly when sown in drills, having had the manure placed directly under them; when turnips sown in the same field, and on the same day, with bone-dust, have entirely escaped their ravages. Their value to the holders of light soils, in thus enabling them to procure the certain means of improving the returns from their land, by this increase of their quantity of nutritive manure, may therefore be considered inappreciable. It has been stated as the comparative result of some experiments, that bone-dust acts in the cultivation of grain, as compared to the best stable manure, in the following proportions:—namely,

In respect to the quality of the corn, as	7 to 5.
In respect to the quantity, as	5 to 4.
In respect to the durability of its effects on the soil, as	3 to 2.*

We cannot indeed agree altogether in this estimate of its powers, but it requires no further arguments to press its application upon the attention of every farmer, who is in possession of ground to which it is suitable. We shall, therefore, only add the following summary of the rules for its application, as recommended by the members of the Doncaster Agricultural Association, from which it appears—

That on dry sands, limestone, chalk, light loams, and peat, bones are a very highly valuable manure.

That they may be applied to grass with great good effect.

That on arable lands, they may be laid on fallow for turnips, or used for any of the subsequent crops.

That the best method of using them, when broad-cast, is previously to mix them up in a compost with earth, dung, or other manures, and let them lie to ferment.

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* N. S. Vol. ii. No. 20. p. 258.

* Repertory of Inventions, No. 86.

That if used alone, they may either be drilled with the seed, or sown broad-cast.

That bones which have undergone the process of fermentation are decidedly superior (in their immediate effects) to those which have not done so.

That the quantity should be about 20 bushels of dust, or 40 bushels of large, increasing the quantity if the land be impoverished: and also, according to our opinion, if the bones have been already manufactured.

That upon clays and heavy loams, it does not yet appear that bones will answer.

On this latter observation, however, a farmer near Nantwich, Cheshire, remarks, that he "occupies a farm in the township of Pickmore, the soil of which is a clay loam, scarcely twelve inches deep, the sub-soil a grey sand, mixed with coarse clay—which the farmers call *rammel*—on a bed of good clay marl. Two years ago, he covered the field with bone-manure; previous to which the grass was so sour, as not to be worth ten shillings per acre; but is now full of most excellent herbage, consisting of white clover and trefoil;" to which he adds, that "in another of his fields, with a clay soil, a small portion of it was manured, thirty-two years ago, by a former tenant, with bones; and that, although it has been twenty years in tillage, yet that part still shows a superiority over the rest."*

From the History of Insects in the Family Library.

NATURAL HISTORY OF ANTS.

Their Industry—Affection for their Young—Courage—Their Anger—Unite in Myriads for War and Extermination—The Fallow Ants—The Sanguine Ants—The Legionary Ants—Attack other Ants, and raduce them to Slavery.

The history of the insects now to be described, presents examples of an industry which has become proverbial, and traits of affection and feeling which would do honor to our own species. Love and courage, patience and perseverance, almost all the higher virtues of human nature, when arrived at the highest pitch of earthly perfection, seem to be the ordinary springs of action in the ant.

Of ants, as of other social insects, the largest portion of the community consists of neuters; beings possessing the most exquisite sentiments of maternity unalloyed by passion; so that from their birth to their death they live, think, and act only for the offspring of another.

The instincts of this insect are, indisputably, more extraordinary than those of any other in the whole range of animated nature. The ancients magnified them into fabulous miracles. Pliny talks of an Indian ant as big as an Egyptian wolf, of the color of a cat, which entered the bowels of the earth in search of gold, of which they are said to have been plundered during the winter by the human inhabitants of those regions.

But exaggeration and credulity apart, the real habits and proceedings of these insects are so extraordinary, that they would stagger our belief, if not confirmed by such observers as Huber and Latreille.

Their nests contain three kinds of individuals—males; females, which have wings; and neuters, which are destitute of these appendages.

"In the warm days which occur from the end of July to the beginning of September, and sometimes later, the inhabitants of the various species of ants may be seen swarming with winged insects; these are the males and females, preparing to quit for ever the scenes of their nativity and education. Every thing is in motion; and the silver wings, contrasted with the jet bodies which compose the animated mass, add a degree of splendor to the interesting scene. The bustle increases, till at length the males rise, as it were, by general impulse into the air, and the females accompany them: the whole swarm alternately rises and falls with a slow movement, to the height of about ten feet; the males flying obliquely with a rapid zigzag motion, and the females, though following the general movement of the column, appearing suspended in the air, like balloons; and having their heads turned towards the wind."

Sometimes the swarm of a whole district unite their infinite myriads, and seen at a distance, says M. Gliditsch,* produce an effect very much resembling an aurora borealis, when from the border of the cloud appear several columns of flame and vapor, attended with a variety of luminous rays and lines resembling forked lightning confined in its brilliancy. The noise emitted by the countless myriads of these creatures is not so loud as the hum of a single wasp, and the slightest breath scatters them abroad. In the midst of these numberless males the females become fecundated, and the greater portion of the former sex immediately perishing, become the food of birds or of fish. So numerous are they, that Dr. Bromley says they formed a column on the water where they had fallen, five or six miles long, eight or ten feet broad, and six inches deep.

The females which escape are destined to found new colonies, and at first to do all the work of neuters; in this particular resembling the mother wasp: but prior to their constructing a new habitation, they make themselves voluntary prisoners, by throwing off their wings. So extraordinary a dismemberment requires to be supported by the testimony of an eye-witness.

Accordingly, Huber, who made the experiment, states, "that having induced an ant to mount a straw, he placed it on a table sprinkled with a little earth, and covered with a glass bell; scarcely did she perceive the earth which covered the bottom of her abode, when she extended her wings, with some effort bringing them before her head, crossing them in every direction, throwing them from side to side, and producing so many singular contortions, that her four wings fell off at the same moment, in his presence. After this change, she reposed, brushed her corslet, traversed the ground, evidently seeking a place of shelter; she partook of the honey he gave her, and at last found a hiding place under some loose earth."

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* New Farmer's Magazine, No. 82, December, 1833.

*A species of ant, called by Linnæus the *formica sacchivora*, appeared in such torrents in the island of Granada, and destroyed the sugar-canes so completely by undermining their roots, that a reward of £20,000 was offered to any one who should discover an effectual mode of destroying them.

They descended from the hills in a flood, and filled not only the plantation, but the roads for miles. Domestic quadrupeds perished; and rats, mice, and reptiles, were devoured by them, and even birds were so harrassed when they alighted as quickly to die. Nothing opposed their march: they blindly rushed into the streams and were drowned in such countless myriads, that the aggregation of their tiny carcasses dammed up the waters, and formed a bridge for others to pass over. The large fires lighted in their paths were speedily extinguished by the rush of their masses, and had not Providence swept them away in the torrents of a terrible hurricane in 1780, every thing must have fallen before them.—*Introduction to Etymology*, vol. i. p. 85.

Huber might well be astonished at the coolness with which the female ant appeared to throw off her wings: one would have thought that as much proportionate suffering would have been felt in her tiny frame, from the loss of these members, as in ours from the amputation of all our limbs; but insects in general do not appear to be sensible of much pain. A wasp will walk about, and even eat, after his body has been cut into two, and a dragon fly will voraciously devour its prey after the removal of its abdomen.

Having cast off its wings, the fecundated female begins to prepare a habitation for herself. In some cases, however, the workers do not allow all the females to quit the old nest; but detaining some of those which have been impregnated, clip their wings and keep them close prisoners so long, that at last they become reconciled to their fate, and prepare to lay eggs. As if still afraid that the impregnated female should depart, a single ant is appointed to watch her motions and supply her wants; no Argus appears to be more vigilant: it mounts on her abdomen, resting its two posterior legs on the ground: these sentinels are constantly relieved. As soon as an egg is deposited, the female becomes the object of the tender care of the neuters, and as a mother she receives those attentions which she would in vain have solicited as a virgin. A court, composed of from ten to fifteen individuals, says Huber, continually follows her; she is unceasingly the object of their care and caresses; all are eager to collect around her, offer her nourishment, and assist her with their mandibles in making her way through difficult and ascending passages; they also lead her through all the different quarters of the ant-hill. The eggs taken up by the laborers at the instant of their being laid, are collected around her. When she seeks repose, a group of ants environ her; several females live in the same nest, and show no rivalry; each has her court, they pass each other uninjured, and sustain in common the population of the ant-hill; but they possess no power, which it would seem is lodged exclusively with the neuters.

"In whatever apartment," says Gould, "a queen condescends to be present, she commands obedience and respect; a universal gladness spreads itself throughout the whole cell, which is expressed by particular acts of joy and exultation. They have a peculiar way of skipping and leaping, and standing upon their hind legs, and prancing with the others. These frolics they make use of, both to congratulate each other when they meet, and to show their regard for their queen; some of them gently walk over her, others dance around her, and she is generally encircled with a cluster of attendants."

Their affection is extended, it would appear from Huber, even beyond life; for when a pregnant female dies, five or six laborers rest near her, and for some days lick and brush her constantly, either with a hope to revive that little particle of cherished dust, or as a tribute of their instinctive love for the departed.

If we observe the ant-hill, we shall see so many traits of this affection of the worker towards the female, as to satisfy us that the imprisonment and mutilation she had undergone at the hands of the former are dictated alone by that instinct which prompts the ant to continue its kind. The republic of ants is not annually dissolved like that of bees and wasps.

Attachment to the female is not the only instance of affection evinced by these insects; they, as well as bees, appear to recognize each other even after a long absence. Huber, having taken an ant-hill from the woods, placed it in his glass hive; finding that he had a superabundance of ants, he allowed some of them to escape, and these formed a nest in his garden. Those which were in the hive he carried into his study, and observed their habits for four months, after which period he placed the hive in the garden within fifteen paces of the natural nest. Immediately, the ants established in it recognized their former companions, with whom they had held no communication for four months; they caressed them with their antennæ, and taking them up in their mandibles, led them to their own nest. Presently others arrived in crowds and carried off the fugitives in a similar manner; and venturing into the artificial ant-hill, in a few days caused such a desertion that it was wholly depopulated.

The above anecdote seems to prove that ants have a language of dumb signs of which the organs are the antennæ. As yet the proofs of this antennal language have been drawn from the affections of these creatures, but more striking ones are derived from their passions. For there are few animals in which the passions assume a more deep and threatening aspect; they unite them in myriads for the purposes of war and extermination.

It would perhaps be too much to say, that the warfare which takes place among ants calls forth bright traits of character, and occasions the exercise of virtues which under no other combination of circumstances could be exhibited. Yet Latreille, after he had cut off the antennæ of an ant, saw another approach it as if compassionating the loss of a member as dear to the owner as the pupil of our eye to us, and after caressing the sufferer, pour into the wound a drop of a liquid from its own mouth.

The causes which give rise to these wars are, no doubt, as important to them as those which urge human monarchs to devastate, and human heroes to struggle for victory. The ants will dispute furiously about a few square feet of dust; and such an object is of equal magnitude and importance to them, as a river, or a mountain, to an emperor. Sometimes a straw, the carcass of a worm, a single grain of wheat, will cause myriads to engage in deadly strife, and leave the miserable inches of surrounding earth thickly strewed with the pigmy dead. Sometimes a nobler aim will cause them to defend to the uttermost their homes and their young, from the marauding ambition of a neighboring hill. "Alas!" says Bacon, "the earth, with men upon it, will not seem much other than an ant-hill, where some ants carry corn, and some carry their young, and some go empty, and all to and fro around a little heap of dust."

"If we wish to behold," says P. Huber, "regular armies wage war in all its forms, we must visit the forests in which the fallow ants establish their dominion over every insect within their territory: we shall there see populous and rival cities and regular roads, diverging from the ant-hill like so many radii from a centre, and frequented by an immense number of combatants; wars between hordes of the same species, for they are naturally enemies, and jealous of any encroachment upon the territory which surrounds their capital. It is in these forests I have witnessed the inhabitants of two large ant-hills engaged in a spirited combat; two empires could not have brought into the field a more numerous or more determined body of combatants.

"Both armies met half-way from their respective habitations, and the battle commenced: thousands of ants took their stations upon the highest ground, and fought in pairs, keeping firm hold of their antagonists by their mandibles; while a considerable number were engaged in the attack, others were leading away prisoners; the latter made several ineffectual endeavors to escape, as if aware that upon reaching the camp a cruel death awaited them. The field of battle occupied a a space of about three feet square: a penetrating odor exhaled on all sides; and numbers of dead ants were seen covered with venom. The ants composing groups and chains laid hold of each others legs and pincers, and dragged their antagonists on the ground; these groups formed successively. The fight usually commenced between two ants, who seizing each other by the mandibles raised themselves upon their hindlegs, to allow of their bringing their abdomen forward, and spurting their venom upon their adversary: they were frequently so wedged together, that they fell on their sides, and fought a long time in that situation in the dust: shortly afterward they raised themselves, when each began dragging its adversary; but when their force happened to be equal, the wrestlers remainded immovable, and fixed each other to the ground, until a third came to decide the contest. It more commonly happened that both ants received assistance at the same time, when the whole four, keeping firm hold of a foot or antenna, made ineffectual attempts to win the battle. In this way they sometimes formed groups of six, eight, or ten, firmly locked all together; the group was only broken, when several warriors from the same republic advanced at the same time, and compelled the enchained insects to let go their bold, and then the single combats were renewed: on the approach of night, each party retired gradually to their own city.

"On the following day, before dawn, the ants returned to the field of battle—the groups again formed—the carnage recommenced with greater fury than on the preceding evening, and the scene of combat occupied a space of six feet by two: the event remained for a long time doubtful; about midday the contending armies had removed to the distance of a dozen feet from one of their cities, whence, I conclude, that some ground had been gained: the ants fought so desperately, that they did not even perceive my presence, and though I remainded close to the armies, not a single combatant climbed up my legs.

The ordinary operations of the two cities were not suspended, and in all the immediate vicinity of the ant-hills order and peace prevailed; on that side on which the battle raged alone were seen crowds of these insects running to and fro, some to join the combatants, and some to escort the prisoners. This war terminated without any disastrous results to either of the two republics; long-continued rains shorted its duration, and each band of warriors ceased to frequent the road which led to the enemy's camp."

The astonishing part of this singular detail is, the instinct which enables each ant to know its own party. Of the same species, alike in form, size, faculties and arms, it yet rarely happens that two of the same side attack each other; and when this takes place, says Huber, "those which are the objects of this temporary error caress their companions with their antennæ, and readily appease their anger." We can comprehend the existence of an instinct which shall, at all times, cause an animal to build its habitation after a distinct fashion, but a spontaneous combination of faculties seems to take place in the conduct of these wars. The insects march, countermarch, take prisoners, distinguish each other, retreat; in short, do all that man would do under similar circumstances. Nothing like the fatality of instinct is perceptible. These wars were accidental, might never have happened, and perhaps only happen in one community out of ten. Neither are they conducted alike in all cases, but are obviously modified according to the varying circumstances of time and place. These very fallow ants, when they attack the sanguine ants, for example, adopt a system of ambuscade and stratagem; and the sanguine ants, if too hardly pressed, send off a courier to their ant-hill for farther assistance, and immediately, says Huber, a considerable detachment leaves the sanguine city, advances in a body, and surrounds the enemy.

That ants, being such determined warriors, should occasionally have games of mimic war is is not surprising. "I visited," says Huber, "one of the fallow ant-hills, exposed to sun, and sheltered to the north: the ants were heaped on one another, enjoying the temperature of the surface of the nest; none of them were at work. This immense multitude of insects presented the appearance of a liquid in a state ebulition, upon which the eye had some difficulty in resting: but when I examined the conduct of each ant, I saw them approach each other, moving their antenæ with astonishing rapidity; with slight movements of their fore-feet they patted the lateral parts of the head of the other ants. After these gestures, resembling caresses, they were observed to raise themselves on their hind-legs, by pairs struggle together, seize each other by a mandible, foot, or antenna, and then immediately relax their hold to recommence the attack. They fastened on the thorax, or abdomen, embraced and overthrew each other, then raise themselves by turns, taking their revenge without producing any mischief. They did not spurt forth their venom as in their hostile combats, nor retain their adversary with the obstinacy which they manifest in their serious quarrels. I frequently visited this ant-hill, which almost always presented the same spectacle, but

I never saw any quitting it wounded or maimed: thus there is reason to believe that, industrious as they are, the ant has its hours of repose, and its season for enjoyment; its serious duties, and its pleasurable gambols."

Connected with the subject of the warfare of ants is the history of a species of this insect, not existing in these islands, called, by Huber, the Amazon, or Legionary Ant, *Formica rufescens* of Latreille. It is both warlike and powerful, and, unlike the rest of the tribe, its habits are far from being industrious. Enough has been said to show that the proceedings of some insects so nearly resemble human actions, as to excite our greatest wonder: but the habits of the legionary are still more surprising than the proceedings of the chiefs which we have just described; it is actually found to be a slave-dealer, attacking the nests of other species, stealing their young, rearing them, and thus, by shifting all the domestic duties of their republic on strangers, escaping from labor themselves. This curious fact, first discovered by Huber, has been confirmed by Latreille, and is admitted by all naturalists. The slave is distinguished from its master by being of a dark ash-color, so as to be entitled to the name of Negro—an epithet now appropriated to the *Formica fusca*, or ash-colored ants. Their masters are light in color. The negro, is an industrious, peaceable, stingless insect; the legionary, a courageous, armed, and lazy one. The relation between them is not, however, that which subsists between a task-master and his bondsman, but a strong attachment is mutually felt—another instance of the modification of instinct, education obliterating in the ash-colored ant all is natural antipathy to another species. All that we know concerning these extraordinary creatures being derived from Mr. P. Huber, the following is a short summary of his account.

While walking near Geneva, between four and five in the evening of the 17th of June, 1804, this distinguished naturalist observed an army of the rufescent or legionary ants traversing the road. The column occupied a space of ten inches in length, by four in breadth; they rapidly quitted the road, passed a thick hedge, entered a pasture-ground, wound through the grass without breaking the line of march, and approached a nest inhabited by the negro or ash-colored ant. Some of its inhabitants were guarding the entrance, but on the discovery of an approaching army, they darted forth on the advancing party. The alarm was communicated to the interior, whence their companions rushed in numbers to join in the defence of their underground residence. The bulk of the army of the legionaries being about two paces off, now quickened their march, and in an instant the whole battalion fell upon and overthrew the negroes, who, after a short and obstinate conflict, retired and took refuge in the lowest parts of the nest. The legionaries now mounted the hillock; some took possession of the principal avenues, while others effected a new breach with their teeth, so as to admit the remainder of the army. Having thus taken the city by assault, they remained in it only a few minutes: returning by the apertures through which they had entered, each carried in its mouth either a larva or a pupa, and scampered away without order or regularity. M. Huber followed them for some time, but lost sight of them in a cornfield. Wishing to observe the assaulted city again, he retraced his steps, and saw a small number of ash-colored laborers perched on the stalks of plants, holding in their mouths the few larvæ which they had succeeded in rescuing from pillage.

The next morning, Huber, taking the same road, with the hope of once more seeing a similar scene, discovered a large ant-hill tenanted by legionaries. At five in the evening, provided the weather be fine, and the temperature 67° Farenheit in the shade, these sally out. During the other part of the day they appear to do little; but at this hour they become restless, assemble on the outside of the city, move round it in circles: a signal is then given, which they pass from one to the other, striking, as they proceed, with their antennæ and forehead, the breasts of their companions; these in their turn, approach those advancing, and communicate the same signal—it is that of departure—as the result satisfactorily proves. Those which receive the intimation are instantly seen to put themselves on the march; the column becomes organized; and not a single amazon remains near the garrison. There is no commander-in-chief, every ant is in turn first, each seeking to be foremost. A small number may, however, be observed constantly returning to the rear: this is probably the means by which the whole army is governed.

With such dispositions, manœuvres, and discipline, Huber saw an army of legionaries set out for a negro city. With their usual impetuosity of attack, one party soon entered, and returned laden with the young of the assailed ant-hill; a second detachment, not meeting with equal success, separated from their companions, and fell on another negro colony, where they met with ample booty; after which the whole number of legionaries marched to their nest in two divisions. As they approached, Huber, saw, to his astonishment, a great number of the very same species which had been pillaged, all around the nest of the legionaries. Was this a diversion made by carrying the war into the enemy's territory? No: the return of the legionaries excited no alarm; on the contrary, the negro ants were seen to approach these warriors, caress them with their antennæ, offer them nourishment, as is the custom among their own species, while the legionaries consigned their prisoners to them to be carried to the interior of the nest.

In this way the same negro colony was observed to be attacked three several times, and each time with complete success; the last attack, however, was made under different circumstances from the first two: the negroes, as if conscious of their exposed situation, had lost no time in throwing up trenches, barricading the several entrances, and reinforcing the guard of the interior; "they had moreover, brought together all the little pieces of wood and earth within their reach; with these they had blocked up the passage to their habitation, in which they had posted themselves in full force."

"The legionaries at first hesitating to approach, rambled about or returned to the rear; they then on a given signal rushed forward *en masse*, with great impetuosity, removing with their teeth and feet the many obstacles which impeded their progress: having succeeded, they entered the ant-hill by hundreds, notwithstanding the resistence of its inhabitants, and carried off their prize to the garrison."

In these attacks the legionaries never take the old negroes prisoners, knowing perhaps that at an adult age the love of home, with all its associations, would be sad obstacles to transplantation; nor is their contest attended with loss of blood; they seek the young, and these being obtained, they speedily decamp with their booty. Nor do they ever begin their predatory warfare before the end of May, or beginning of June; if they commenced at an earlier period to purloin the young negroes, they might secure a large supply of captives, but then it would principally consist of males and females, and these it seems nature does not permit them to seize: for she has ordained that, in the ant-hills destined to pillage, the males and females shall be produced earlier than the males and females shall be produced earlier than the males and females of the legionaries; and it is only after their own males and females have undergone the last change, that the instinct which prompts them to steal the young of others begins to operate. Hence, Huber has distinctly ascertained, and Latreille has confirmed the discovery, that the legionary ant-hill contains male, female, and neuter amazons, together with negro-neuters, but never negro males or females. The *amazon* female, after having cast off her wings, lays the foundation of her own nest, and performs all the duties of a laborer. There is no doubt that these creatures have the ability to work, and do so; but as soon as they obtain slaves to do that for them which they ought to do themselves, they relinquish every domestic duty, and during the day "tranquilly wait, at the bottom of their subterranean abode, the hour of departure, reserving their strength, courage, and the address which they so well know how to display, for the purposes of war."

On the negroes reared among them they depend not only for house and home, but even for food; and these faithful and affectionate servants begrudge neither labor nor pains, in providing for their masters. Huber enclosed thirty amazons with several pupæ, and larvæ of their own species and twenty negro pupæ in a glass box, the bottom of which was covered with a thick layer of earth; honey was given to them, so that, although cut off from their auxiliaries, the amazons had both shelter and food: at first they appeared to pay some little attention to the young; this soon ceased, and they neither traced out a dwelling, nor took any food; in two days one-half died of hunger, and the other remained weak and languid: commiserating their condition, he gave them *one* of their black companions: this little creature, unassisted, formed a chamber in the earth, gathered together the larvæ, put every thing into complete order, and preserved the lives of those which were about to perish.

In order to obtain a more intimate knowledge of the facts, the same observer of nature opened and deranged an ant-hill in which the negroes and amazons dwelt together; in doing so, the aspect of their city was so altered as not to be recognized by the amazons, and they were seen wandering at random over its surface. The negroes, however, appeared to be well acquainted with the new localities of the ant-hill, and relieved them from their embarrassment, by taking them up gently in their mandibles, and conducting them to the galleries already pierced. "An amazon was frequently seen to approach a negro, and play upon its head with its antennæ, when the latter immediately seized the former in its pincers, and deposited it at one of the entrances; the amazon ant then unrolled itself, caressed once more its kind friend, and passed into the interior of the nest; and then the negro lost its way too, and wandered about carrying the amazon.

"I observed one," continues Huber, "after ineffectual windings, take the precaution of laying its burden on the ground: the amazon remained on the same spot until the negro returned to its assistance, which having well ascertained and examined one of the entrances, resumed its load, and bore it into the interior."

If the entrance to any gallery happened to be obstructed, the negro, depositing its burden, went to remove the obstruction, and again taking up the amazon, introduced it into the nest. It often happens that the ant-hill is not sufficiently commodious, in this case the negroes alone decide upon the expediency of a removal, and choose a spot for the new dwelling; they set about building, and as soon as the works are sufficiently advanced, appear eager to conduct the legionaries to the new city: for this purpose, each negro takes up an amazon, which it carries to the chosen spot, so that a long line of these faithful creatures may be seen extending all the way from the old to the new town; their charges are then deposited at the various entrances, when other negroes come out, welcome their arrival, and usher them into the interior of their new abode.

The negro is not the only species of ant subjugated by the legionaries. The mining ants are attacked for a similar purpose; but as these are a much more resolute race than the pacific ash-colored tribe, the legionaries are obliged to vary their tactics.

In one of these forays, the amazons," says Huber, "proceeded like a torrent along a deep dike, and marched in a more compact body than ordinary, and in a short time reached the nest they proposed to attack. As soon as the legionaries began entering the subterranean city, the miners rushed out in crowds, and while some fell upon the invaders with great spirit, others passed through the scene of contest solely occupied in bearing off to a place of safety their larvæ and pupæ."

The amazon army was often despoiled of its booty, but their superiority address and agility at length gave them the advantage, and in a quarter of an hour they were seen returning home wards loaded with prey—not, however, straggling, and a file, as after an assault upon the negroes, but in a compact mass; a precaution so much the more necessary, as the courageous miners disputed every inch of ground, following and attacking them until they arrived within ten paces of the amazonian citadel.

Besides the amazons, there is another slave-making species, called the *formica sanguinea;* a species which has not as yet been discovered in this island. They are larger than the legionaries: unlike them, however, they share the labor with their slaves. Their mode of attack is very different from that of the legionaries; the latter carry every thing by sheer impetuosity; the former never pour in immense masses, but attack in small divisions: they sometimes go one hundred and fifty paces, to attack a negro habitation, and the various divisions succeed each other by means of couriers, which are evidently sent off to fetch assistance from the garrison.

"On the 15th July, at 10 A. M.," says Huber, "a small division of sanguine ants was despatched from the garrison, and arrived in quick march near a nest of negro ants, situated twenty paces distant, around which they took their station. The inhabitants perceiving the strangers, rushed forth, and made several prisoners; the sanguine ants advanced no farther: they appeared to be waiting for reinforcements; from time to time, little companies arrived from the garrison to strengthen the brigade: thus reunited they advanced a little nearer, and seemed more willing to run the risk of a general engagement; but in proportion as they approached the negro dwelling, the more solicitous did they seem to despatch couriers to the garrison, who, arriving in great haste, produced considerable alarm, when another division was immediately despatched to join the army. The negroes took up a position of about two feet square, in front of their nest, where nearly their whole force was assembled, awaiting the enemy." In the interim, the pupæ were removed to the side of the nest facing the field of battle, so that they might be conveyed away at a moment's warning, affording a trait of what Huber calls prudence, and certainly a marvellously singular one it is. When fighting with the amazons, the impetuosity of the attack leaves the negro-ant no time for thought, but in their contests with the sanguine ant, they vary their tactics so as to meet the new circumstances. The latter instances being sufficiently reinforced, make the attack, and band after band pillage and carry away their booty, not in a few minutes, as is done by the amazons, but during the whole day; and if the pillaged city should suit them better than their own, they remove to it on the following morning; at least so it appears in an instance observed by Huber. It is rare, according to that author, that they do not change at least once during the year. They certainly inspire the negroes with great terror, for these, once attacked by them, generally forsake their nest forever.

"To their own slaves they are much attached; the sanguine ants are often besieged by the fallow ants: on these occasions they carry their servants to the lowest chambers, and these, as if aware of the intention of their removal, immediately begin barricading the different entrances, with every species of material lying within their reach.

"The sanguine ants evince extraordinary foresight in these engagements; for while one party is fighting, another is engaged in bearing away the negroes, who immediately begin constructing a new dwelling at a considerable distance from the scene of combat."

Such is is the extraordinary recital contained in that delightful work of Huber's, every fact of which has been confirmed by the subsequent observations of the accurate and learned Latreille. It would seem that the negro and miner ants are both occasionally enslaved and dwelt together in the sanguine ant-hills. And Huber has brought up legionaries and sanguine ants, which are both slave-makers, with negroes, in one common dwelling.

[From the London Mechanics' Magazine.

THE ICE TRADE BETWEEN AMERICA AND INDIA.

The arrival of the Tuscany with a cargo of ice from America forms an epoch in the history of Calcutta worthy of commemoration, as a facetious friend remarked, in a medal of *frosted* silver. In the month of May last we received a present of some ice from Dr. Wise, at Hugil, (whose efforts have been so long directed to the extension of its manufacture by the native process,) as a proof that the precious luxury might be preserved by careful husbandry, until the season when its coolness was the most grateful: little did we then contemplate being able to return the compliment, with a solid lump of the clearest crystal ice at the conclusion of the rains! nor that we should be finally indebted to American enterprise for the realization of a pleasure for which we have so long envied our more fortunate countrymen in the upper provinces; nay, even the beggars of Bokhara, who in a climate at times more sultry than ours, according to Lieutenant Burnes, "purchase ice for their water, even while entreating the bounty of the passenger." Professor Leslie with his thousand glass exhausters, and his beautiful steam-air pumps, tantalized us with the hopes of a costly treat, and ruined poor Taylor, the bold adopter of his theory; but science must, in this new instance, as on many former occasions, confess herself vanquished or forestalled by the simple practical discovery, that a body of ice may be easily conveyed from one side of the globe to the other, crossing the line twice, with a very moderate loss from liquefaction.

We are indebted to Mr. J. J. Dixwell, the agent of the proprietors, for the following interesting particulars relative to the Tuscany's novel cargo, and the mode of shipping ice from America for foreign consumption.

The supplying of ice to the West Indies and to the southern States of the Union, New Orleans, &c., has become within these few years an extensive branch of trade under the successful exertions of its originator, Frederick Gudar, Esq., of Boston, with whom S. Austen, Esq., and Mr. W. C. Rogers, are associated in the present speculation.

The ponds from which the Boston ice is cut, are situated within ten miles of the city; it is also procured from the Kennebec and Penobscot rivers, in the state of Maine where it is deposited in ice-houses on the banks and shipped from thence to the capital. A peculiar machine is used to cut it from the ponds in blocks of two feet square, and from one foot to eighteen inches thick, varying according to the intensity of the season. If the winter does not prove severe enough to freeze the water to a convenient thickness, the square slabs are laid again over the sheet ice, until consolidated and so recut. The ice is stored in ware-houses constructed for the purpose at Boston.

For shipping it to the West Indies, a voyage of ten or fifteen days, little precaution is used. The whole hold of the vessel is filled with it, having a lining of tan, about four inches thick, upon the bottom and sides of the hold; and the top lifts covered with a layer of hay. The hatches are then closed, and are not allowed to be opened till the ice is ready to be discharged. It is usually measured for shipping, and each cord reckoned at three tons; a cubic foot weighs 58½ lbs.

For the voyage to India, a much longer one than had been hitherto attempted, some additional precautions were deemed necessary for the preservation of the ice. The ice hold was an insulated house, extending from the after part of the forward hatch to the forward part of the after hatch, about fifty feet in length. It was constructed as follows:—a floor of one-inch deal planks was first laid down upon the dunnage at the bottom of the vessel; over this was strewed a layer, one foot thick of tan; that is, the refuse bark from the tanners' pits, thoroughly dried, which is found to be a very good and cheap non-conductor: over this was laid another deal planking, and the four sides of the ice-hold were built up in exactly the same manner, insulated from the sides of the vessel. The pump, well, and main-mast, were boxed around in the same manner.

The cubes of the ice were then packed or built together so close as to leave no space between them, and to make the whole one solid mass. about 180 tons were thus stowed. On the top was pressed down closely a foot of hay, and the whole was shut up from access of air, with a deal planking one inch thick nailed upon the lower surface of the lower deck timbers; the space between the planks and deck being stuffed with tan.

On the surface of the ice, at two places, was introduced a kind of float, having a guage rod passing through a stuffing-box in the cover; the object of which was to denote the gradual decrease of the ice, as it melted and subsided bodily.

The ice was shipped on the 6th and 7th of May, 1833, and discharged in Calcutta on the 13th, 14th and 15th, and 16th of September, making the voyage in four months and seven days. The amount of wastage could not be exactly ascertained from the sinking of the ice-guage; because, on opening the chamber, it was found that the ice had melted between each block, and not from the exterior only, in the manner of one solid mass, as was anticipated. Calculating from the rods, and from the diminished draught of the ship, Mr. Dixwell estimated the loss on arrival at Diamond Harbor, to be fifty-five tons; six or eight tons more being lost during the passage up the river; and probably about twenty in landing. About one hundred tons, say three thousand maunds, were finally deposited in the ice-house on shore; a lower room in a house at Brightman's Ghaut—rapidly floored, and lined with planks for the occasion.

The sale has not, we believe, been so rapid as might have been expected, amounting to no more than ten maunds per diem, although Mr. Rogers has fixed the price at the low rate of four annas per seer, one half of the price estimated for the Hugil ice, which was calculated to be somewhat cheaper in proportion than saltpetre. The public requires to be habituated to it, and to be satisfied of the economy of its substitution for the long-established process of cooling. There may also be some doubts of the best mode of preserving so fleeting a commodity; but on this head we cannot but advise an imitation of the methods pursued on a large scale on board of the Tuscany. For the application of the ice to the purposes of cooling, ample directions have been given in the "Gleanings of Science," vol. iii. p. 120. A box or basket, or tin case, with several folds of blankets, or having a double case lined with paddy chaff, or any non-conducting substance, will preserve the ice until wanted; and for cooling water or wine, the most effectual method of all is to put a lump of the clear crystal into the liquid. The next best is to spread fragments upon the bottles laid horizontally, and have them wrapped in flannel for a couple of hours.

So effectual was the non-conducting power of the ice-house on board, that a thermometer placed on it did not differ perceptibly from one in the cabin. From the temperature of the water pumped out, and that of the air in the rim of the vessel, Mr. Dixwell ascertained that the temperature of the hold was not sensibly affected by the ice. Upon leaving the topic, and running rapidly into higher latitudes, it retained its heat for some time; but after being several weeks in high latitudes, and becoming cooled to the temperature of the external air and sea, it took more than ten days in the tropics before the hold was heated again to the tropical standard.

From the Genesee Farmer.

SMALL MATTERS.

These are the very things about which farmers in general are far too negligent. The great things are allowed to engross the whole time and care, while the important facts that every thing great is composed of parts, is wholly overlooked. If the parts are taken care of, the whole is safe; but a neglect of items frequently causes serious or total loss. It is the neglect of small matters in farming that makes such an annual reduction in the profits of the farm; and more agriculturists fail of securing competence in consequence of this fault than any other, or perhaps all others put together. A few kernels of chess, or a little smut in your seed wheat, are small matters of themselves, but the influence they exercise on the crop is generally a serious affair; yet too many deem their presence so small a matter, that an hour or two of fanning and liming is considered as time thrown away. A shingle from the roof of the barn is a small matter, so small that many farmers think it unworthy of notice; yet that shingle opens a place through which the rain falls on the wheat or the hay, and does sufficient damage in the mow to pay for a thousand shingles, and the expense of putting them on in the bargain. A rail fallen from the top of the fence, a board knocked off the gate, a hole made under the fence by the pigs, are also among the small matters, that too many farmers pass by as unworthy of notice. Yet when he gets up some fine morning, and finds his herds pasturing in his wheat, occasioning the loss of some half a dozen head—when he sees some unlucky stroller in the highway take advantage of the defect in his gate and demolish the remainder—and when he finds that his pigs have destroyed half an acre of potatoes, and made a feast of his garden vegetables, then he begins to think five minutes spent in preventing such accidents, springing from pure carelessness, would be better than a week spent in remedying or regretting them. The man who never pays attention to small matters, is precisely one of those who suffers most from unruly cattle and horses, who spends the most money in paying, and the most time in repairing, damages, and who will, unless he turns over a new leaf, most assuredly find that the whole cannot be greater than the parts, and that he is running on a rock which has been the ruin of thousands.

There are other small matters not so intimately connected perhaps with *success* in farming as those we have hinted above, yet which are equally, and perhaps more indispensable to the real *comfort* of the farmer. The mode of life which a man leads in his family—the manner in which the articles he provides for the use of his family are disposed of—the training and education of the children—and the taste he acquires and cultivates, may be numbered among these. Separately they are too generally considered of little consequence, yet united as their influence is, and must be, to be right in these things is very important.

The appearance of the farm dwelling, the skill shown in planning, and the taste in embellishing, are often ranked among the small matters of the farmer. Too many seem to imagine, that the farmer has no business with any thing but the plough and the hoe—that it is of no consequence whether his taste, and his moral and intellectual qualites are properly cultivated and trained, forgetting that in the farming population resides the government—that they in reality make and unmake governors and presidents—and that as they are well or ill-informed, so will their conduct be judicious or injurious.

Planting a tree for ornament or for use—a rose bush for its fragrance and its beauty—the lilac and the snowball for their agreeable appearance—the bed of strawberries for the gratification of the palate—the training the clematis or the bitter-sweet over the windows, to temper the light and refresh the mind by their vivid green and waving foliage, are all ranked among the small matters by many farmers, and the few minutes required to accomplish all this, is deemed by such time thrown away. On the contrary, we think these very things as of great consequence; every tree and shrub planted adds to the value of the farm, for there are few men so insensible to natural beauty as not to be willing, in purchasing a farm, to pay something extra for its gratification; and no idea of agricultural comfort can be formed, in which some, or all of these things, do not make part. Wealth is composed of parts of dollars—the longest life of seconds—happiness of single sensations—and the prosperity of the farmer very much depends on the strict observance of small matters. Dr. Franklin's advice was to take care of the pence, and the pounds, as a matter course, would take care of themselves.

G.

From the Genius of Liberty.

SILK CULTURE PROPOSED IN LOUDOUN.

At a meeting of sundry citizens of the county of Loudoun, assembled in pursuance of notice, in the Court House, on the 8th day of August, for the purpose of considering the means of introducing the culture of Silk in said county—on motion, Cuthbert Powell, Esq. was called to the Chair, and Thomas M. Colston appointed Secretary.

The object of the meeting was explained by H. B. Powell, Esq. in a brief and forcible manner, and further supported by some striking statements from the Hon. Chas. Fenton Mercer and S. B. T. Caldwell, Esq. illustrating the great facility of culture, and the large profits resulting therefrom. When on motion of H. B. Powell, Esq. and John Janney, Esq. the following resolutions were unanimously adopted.

1st. *Resolved*, as the sense of this meeting, That it is highly expedient and proper to aid and encourage the introduction and culture of silk within the county of Loudoun.

2d. *Resolved*, That as a means of accomplishing this object, the Board of Overseers of the Poor of Loudoun be, and they are hereby requested to take such steps as they may deem expedient, to establish a mulberry orchard, upon the poor-house farm of this county, upon such a scale as to them may seem advisable and necessary.

3d. *Resolved*, That the Chairman of this meeting do forward a copy of the proceedings hereof, to the President of the board of the overseers of poor, with a request that he will submit them to the consideration of that body.

4th. *Resolved*, That the respective editors of newspapers in the town of Leesburg, be requested to publish the above proceedings.

CUTHBERT POWELL, Chairman.
THOMAS M. COLSTON, Secretary.

[We rejoice to see, in the above resolutions, a movement on the plan which we have before recommended, and still consider one of the safest grounds on which to commence silk culture in Virginia. Each of our county and town poor-house establishments furnishes enough of land, labor, superintendence and capital, for this pupose. Let this most suitable direction be given (and in proper manner,) to their now wasted means, and poor houses might perhaps cease to be nuisances—expensive, not only of public money, but of the labor and morals of the most destitute class of society.]

From the Farmers' Magazine of 1812.

ON THE DIFFERENCE IN THE EFFECT OF DUNG UPON DIFFERENT SOILS—AND UPON THE SAME LAND BEFORE AND AFTER IT HAS BEEN LIMED.

[The following communication is from the aged and venerable farmer who has been sometimes honored, and not undeservedly, by the name of the "Father of Scottish Husbandry"—and it deserves attention, not only for the truth and value of the opinions it conveys, but for the novelty and rareness of their appearance. So far as we know, this is the only instance, before the first publication of the *Essay on Calcareous Manures*, (and this was not known until after that publication.) of its being maintained by any book, or writer, that natural poor soils cannot be profitably and durably enriched by dung alone, until after they have been limed. The deductions from Mr. Dawson's statements accord entirely with the opinions maintained in the work referred to, as to the effects of manure on poor soils.

The concise memoir of Dawson, which will follow, is from a later volume of the same work, (in 1815) published after his death.]

That dung produces much greater effect upon good than upon bad land, when in tillage, is generally known, though not so fully attended to as it ought to be; but the difference in its effects upon different kinds of land, when in grass, though much more considerable, has been very little observed; notwithstanding it is obvious that the dung of animals has a great effect upon all pastures which consist of what are called the finer grasses; that it has scarcely any upon land that is covered with bent-grass, or fog; and that it is of more or less value upon pastures, as herbage of the former or latter description predominates.

As accidental circumstances directed my attention more particularly to these consequences, it may be of use to publish an account of them in your Magazine, so far as they have been ascertained by my own experience; since it may induce some of your readers to communicate other facts and observations illustrative of this important subject.

In the year 1754, having occasion to carry a quantity of very fine black loam from a head-ridge of old infield land, to give the surface-water a free passage, it was laid upon outfield benty grass land adjoining, of which it covered about a quarter of an acre fully one inch thick. No grass seeds were sown upon this new covering; yet white clover, and other fine grasses, sprung up and gradually increased upon it; and the bent, upon which the loam was laid, diminished so speedily, that very little of it remained in the third year thereafter.

A few years after this, having a considerable extent of outfield land in fallow, which I wished to lime previous to its being laid down to pasture, and finding that I could not obtain a sufficient quantity of lime for the whole in proper time, I was induced, from observing the effects of the fine loam upon the surface of similar soil, even when covered with bent, to try a small quantity of lime on the surface of a part of this fallow, instead of a larger quantity ploughed down in the usual manner. Accordingly, in the autumn, about twenty acres of it was well harrowed, and then about fourteen Winchester bushels only of unslacked lime was, after being slacked, carefully spread upon each English acre, and immediately well harrowed in. As many pieces of the lime, which had not been fully slacked at first, were gradually reduced to powder by the dews and moisture of the earth—to mix that with the soil, the land was again well harrowed in three or four days thereafter. This land was sown in the spring with oats, with white and red clover and rye-grass seeds, and well harrowed, without being ploughed again. The crop of oats was good; the plants of grass sufficiently numerous and healthy; and they formed a very fine pasture, which continued good until ploughed, and years after, for corn.

About twelve years afterwards, I took a lease of the hilly farm of Grubbet; many parts of which, though of an earthy mould tolerably deep, were too steep and elevated to be kept in tillage. As these had been much exhausted by cropping, and were full of couch-grass, to destroy that, and procure a cover of fine grass, I fallowed them, and laid on the same quantity of lime per acre,—then harrowed, and sowed oats and grass seeds in the spring; exactly as in the last mentioned experiment. The oats were a full crop, and the plants of grass abundant. Several of these fields have been now above thirty years in pasture, and are still producing white clover and other fine grasses; no bent or fog has yet appeared upon them. It deserves particular notice, that more than *treble* the quantity of lime was laid upon fields adjoining of a similar soil, but which, being fitter for occasional tillage, upon them the lime was ploughed in. These fields were also sown with oats and grass seeds. The latter throve well, and gave a fine pasture the first year; but afterwards, the bent spread so fast, that, in three years, there was more of it than of the finer grasses.

In all these instances, where the lime was only harrowed in, and not ploughed down, the land not only continued to produce the fine grasses, but the dung of the animals feeding upon them had the same effect in increasing the quantity and verdure of the grass, as it has upon rich, loamy, infield soils; of this, the parts of Grubbet hills, above alluded to, afford a full proof at this day. Whereas, wherever the lime was ploughed down, the parts of the soil at the surface, which were not sufficiently mixed with lime, though sown with clovers, became gradually covered with bent; and dung of the animals had little or no effect upon such benty parts. That animal dung has little or no beneficial effect upon such pastures, is obvious from this circumstance, that, in all hilly countries, there are great tracts of benty grass land, which have continued for centuries, though constantly pastured with sheep or cattle, without any visible improvement; the animal dung neither increasing the quantity, nor improving the quality of the pasture. But it is still more remarkable that dung has no permanent effect upon such soils, even when ploughed down, as appears from the following facts.

In the year 1756, about five acres of earthy outfield benty land, were folded with sod-dikes, and very well dunged, with the intention of ploughing it for oats; but upon determining, afterwards, to enclose about sixty acres to be continued in pasture, of which these five acres made a part, the intention of ploughing these folds was given up; and the dikes were thrown down in the spring, well harrowed, and sown with rye-grass. The effect of the dung upon that land was very considerable the first year, a great deal less so the second, very little the third, and was not visible afterwards. Seven years thereafter, it was ploughed for oats along with the rest of the field, when the effects of the dung were expected to be considerable; but the crop was no better upon the folded part, than upon the others; nor was it any better upon the sides of the sod-dykes, where the dung had been at first fully covered in by the earth of the sods.

Some years afterwards, about ten acres of benty outfield was fallowed, and intended to be limed; but, for particular reasons, no part of it was limed. One half of it, however, was dunged from the farm-yard. The whole field was sown with oats and ryegrass seeds. The crop of oats was much better upon the part that was dunged, as was also the ryegrass the first year; but the bent spread so fast upon both parts, that no ryegrass was left the fourth year, nor was there any greater verdure upon the part that was dunged than upon the other part. When the whole field was ploughed some years after, there was no visible difference in the crops between the two parts: the crop upon both was very bad.

But from the following facts it appears, that upon that sort of soil, when properly mixed with lime, the effects of dung are not only greater, but much more permanent, whether under tillage or pasture. After laying at least fifty bushels of unslacked lime upon each English acre of the dry benty land of the farm of Frogden, I cropped it in what was then called the Norfolk rotation; viz. 1st year, Turnip; 2d, Barley or Oats; 3d, Grass; and, 4th, Oats or Wheat. It was expected that this mode of cropping would not exhaust the land; but I found, even in the second round, that the crops were so very much worse on the thin soils, that it was necessary to allow the land to continue some years in pasture to recover its fertility; and for that purpose, it was sown with equal quantities of red, white, and yellow clovers, with a small portion of rye-grass seeds. As the land had been twice fallowed, and carried three crops of turnips horse-hoed after liming, and had never been ploughed deep, the surface-soil was well mixed with lime; and accordingly, the clovers were not afterwards injured by the native bent. But as the land had been exhausted by cropping, sheep were folded upon it in nets the first summer. Their dung greatly increased the quantity and richness of the pasture; and though the effect was less the next year, it continued to be considerable, and the pasture seemed still improving after the third year. After being six years in grass, the land was ploughed up, and produced full crops. As the soil of the fields treated in this manner was in every respect similar to that of the five acres which were folded in 1756, and to the soil of the field of ten acres, half of which was dunged from the farm yard, as already mentioned, the very great superiority in the permanency of the effects of dung in the latter instance, over that in the two former, can only be imputed to the lime.

From the preceding statement, the following conclusions deserve the attention of agriculturists.

1st. That animal dung dropped upon coarse, benty pastures, produces little or no improvement upon them; and that, even when sheep or cattle are confined to a small space, as in the case of folding, their dung ceases to produce any beneficial effect, after a few years, whether the land is continued in pasture, or brought under the plough.

2d. That even when land of this description is well fallowed and dunged, but not limed, though the dung augments the produce of the subsequent crop of grain, and of grass also for two or three years, that thereafter, its effects are no longer discernible either upon the one or the other.

3d. That when this land is limed, if the lime is kept upon the surface of the soil, or well mixed with it, and then laid down to pasture, the finer grasses continue in possession of the soil, even in elevated and exposed situations, for a great many years, to the exclusion of bent and fog. In the case of Grubbet hills, it was observed, that more than thirty years have now elapsed. Besides this, the dung of the animals pastured upon such land, adds every year to the luxuriance, and improves the quality, of the pasture, and augments the productive powers of the soil when afterwards ploughed for grain;—thus producing, upon a benty outfield soil, effects similar to what are experienced when rich infield lands have been long in pasture, and which are thereby more and more enriched.

4th. That when a large quantity of lime is laid on such land, and ploughed down deep, the same effects will not be produced, whether in respect to the permanent fineness of the pasture, its gradual amelioration by the dung of the animals depastured on it, or its fertility when afterwards in tillage. On the contrary, unless the surface is fully mixed with lime, the coarse grasses will, in a few years, regain possession of the soil, and the dung thereafter deposited by cattle will not enrich the land for subsequent tillage.

Lastly, It also appears from what has been stated, that the four-shift husbandry is only proper for very rich land, or in situations where there is a full command of dung: That by far the greatest part of the land of this country, requires to be continued in grass two, three, four, or more years, according to its natural poverty: That the objection made to this, viz. that the coarse grasses in a few years usurp possession of the soil, must be owing to the surface soil not being sufficiently mixed with lime, the lime having been covered too deep by the plough.

There are other manures besides lime, which to a certain degree, produce similar effects, upon which some observations may be offered at a future opportunity.

I am, sir, yours, &c.
WILLIAM DAWSON.
Edinburgh, 2d March, 1812.

From the Farmers' Magazine of 1815.

MEMOIR OF WILLIAM DAWSON, ESQ. OF GRADEN.

Mr. Dawson, the subject of this Memoir, was born at Harperton, in Berwickshire, of which his farther was tenant, in February 1734. He was sent to England when about 16 years of age, for the purpose of acquiring a more correct knowledge of practical agriculture, than was at that time to be obtained in his native county, where modern improvements had not yet commenced. His first residence was with Mr. Ball, agent to the Duke of Leeds, near Sheffield, in Yorkshire, where he continued three or four years. During this period Mr. Dawson regularly took a share in all the operations of a farm, and acquired that expertness in every branch of labor which he found of so much advantage to him in instructing his servants, when he came to adopt the same management on his farms in Scotland. Among other improvements, it was here that he first witnessed the cultivation of turnips according to the best practices of those times. His leisure hours were occupied in extending his knowledge beyond the different parts of manual labor in which his time was principally employed, and particularly in acquiring a coonsiderable degree of skill in the construction of agricultural implements; in which, throughout the course of a long life, he made many useful improvements. From Mr. Ball's Mr. Dawson went into Essex, and resided some time on the estate of Lord Fitzwalter, where he gave his attention chiefly to the diffierent branches of grazing; and he afterwards travelled through several other counties of England, accurately examining the best courses of husbandry, and storing up for his own use whatever seemed likely to be introduced with advantage into his own country.

On his return to Harperton he immediately began, with the consent of his father, to make trial of such modes of cultivation as seemed adapted to the soil of that farm; in particular, he employed clay-marl to a great extent, at a time when the use of that manure was scarcely known in that district; and 'instead of dropping the attempt, as 'Lord Minto seems to have done, he persevered for 'several years, till better access was opened up to 'lime, and till he found that, owing to the trouble 'and expense attending marl, he could manure a 'larger extent of ground yearly with lime, at a 'cheaper rate.'* But as the soil of Harperton was not adapted to turnips, he did not commence the culture of this root upon a large scale, till he entered to the farm of Frogden on his own account, in 1759.

The arable land of the farm of Frogden is chiefly of a sandy soil, and was at that time without fences, and otherwise in a very unproductive state, so that great exertions in enclosing, cleansing, draining, and manuring the land, were required for several years at the commencement of Mr. Dawson's lease. Here he employed lime to so great an extent, that the proprietor, afraid of the injurious effects which had been often experienced from severe cropping after lime, readily agreed with Mr. Dawson for a life-rent lease, at a small advance of rent, in addition to the original one of 19 or 21 years. It is not true, as has been alledged, that Mr. Dawson used so much lime, because the proprietor had obliged himself to pay its original cost. The whole expense was incurred by himself, though his exertions at that time were so extraordinary as to appear to all his neighbors little suited to the circumstances of a tenant. The lime was brought from a distance of almost twenty miles, at first in four-wheeled, wagons, drawn by four horses, but afterwards in two-horse carts, to which he always continued to give the preference over wagons.

Draining, which was then very little known in Roxburghshire, was executed by Mr. Dawson in a very effectual manner; and, when he was in want of stones, he had recourse to an expedient which he had seen adopted in Essex. With implements contrived for the purpose, the drains were made wide at the top, of the requisite depth, and very narrow at the bottom. He then filled them with broom, placing the bar stalks undermost, and compressing their bushy tops above, through which the earth can penetrate but a very little way. Some of them, says Dr. Douglas,† have lasted upwards of thirty years, without any appearance of failure.

But that for which the agriculture of Scotland is most eminently indebted to Mr. Dawson, is the culture of turnips. Before his time, this valuable root, the foundation of all good husbandry on dry soils, had been introduced by proprietors both in the east and west of Scotland; but it had made very little progress, and produced no improvement in the general state of agriculture, even in what were then considered the best cultivated counties. The farmers of those times, like the lower classes of the tenantry at present, had an insuperable aversion to every innovation on their established routine; and viewed the attempts of proprietors, without the least inclination to imitate them. But when Mr. Dawson, himself a rent-paying farmer, cultivated turnips upon an extensive scale, his practice began to be followed by some of his neighbors; and from his example, and by means of the workmen whom he trained, the present most approved mode of cultivating turnips gradually spread over all the south-eastern counties.

Mr. Dawson began the cultivation of turnips at his entry to Frogden farm; but is understood that they were raised in the broadcast manner till 1763, when he adopted the practice of drilling. The first drills were formed by laying two furrow-slices together, leaving a space untouched between each drill; and this firm ground was afterwards raised by a plough that followed; so that every drill or ridgelet consisted of four furrows laid together, instead of two, as at present. Mr. D. himself, when this mode was first tried, held the plough that formed the two-furrow ridgelets; and was followed by his best ploughman, who cleaved out the interval that was left between them. At this time, though two-horse ploughs were sometimes used, and always by Mr. Dawson, a driver was constantly employed to guide the horses; but in the afternoon of the very first day, a trial was made to dispense with the driver when forming the first ridgelets or feerings; and so evident were the advantages of the ploughman himself directing the horses, that very soon afterwards all the drivers were dismissed. Mr. James M'Dougal, now tenant in the parish of Dinton, in Tweeddale, was the first ploughman in Scotland, that ever drew a straight furrow with two horses without a driver, and was the first person whom Mr. Dawson employed to form the turnip drills in the way just mentioned. The breadth of the drills was at first 3 feet, but after the land was once thoroughly cleaned, so great a breadth was found unnecessary, and they were accordingly reduced to the present breadth of 30 or 27 inches. The extent of his turnip crop was usually about 100 acres yearly. At first they were consumed mostly by cattle, which were sold throughout the winter and spring, for many years chiefly in Edinburgh market. At this time very few cattle were fattened in Scotland after the grass season; and the profits of this and other branches of Mr. Dawson's management were accordingly considerable. Thus, the predictions of his ruin, which were freely hazarded by his neighbors, were soon succeeded by an irresistible conviction of the superiority of his system, and by the imitation of those practices which were at first very generally ridiculed. Sometime after, however, Mr. Dawson being satisfied of the great benefit which the land received from the turnips being eaten on the ground by sheep, gave up the fattening of cattle; and his whole turnips, latterly, were allotted to sheep alone, with the exception of a small portion carried to his straw-yard cattle, to convert the straw into manure.

Mr. Dawson, for several years after his entry to Frogden, adopted what was called the Norfolk rotation, one-half of his arable land being under corn, and the other half under clover and turnips, in equal proportions. But he soon found that his soil was too weak for this constant tillage; and that it was necessary, in order to ensure abundant crops, that his clover division should be left in pasture for three years or more. This course he ever afterwards persevered in, and all his crops were accordingly most luxurient and productive.

The success which was the just reward of Mr. Dawson's judicious and spirited management, induced him to extend his concerns beyond the farm of Frogden; and he afterwards rented the contiguous farms of Morbattle Tofts and Grubbet, about three miles distant. On these farms, the former of which consists of low lying arable land, the latter chiefly of steep hills, better adapted for sheep pasture, Mr. Dawson repeated all his former operations; and the vast improvement effected on the hills of Grubbet, by means of lime, are still conspicuous among the pastures of that district, after the elapse of upwards of thirty years. Such parts of them as were too steep to be frequently brought under tillage, were limed on the surface, after being cleaned by fallow or turnips; and the lime was harrowed in with the grass seeds sown along with the first crop thereafter;—a mode of management by which a small quantity of lime was found to produce very beneficial effects in raising and maintaining the finer grasses, and which, in such situations, ought to be more generally adopted.

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* Douglas's Survey of Roxburghshire, p. 135.

† Survey of Roxburghshire, p. 181.

The consequence of this liberal and judicous expenditure was soon visible in the increase of his fortune, which enabled him to purchase and improve the estate of Graden, an extensive property adjoining to his farm of Frogden.

During the last twelve or fifteen years of his life, Mr. Dawson retired from the personal superintendence of his farms, which then devolved upon his two sons, the elder of whom still possesses the farms of Morbattle Tofts and Grubbet; and the younger remained at Frogden till Mr. Dawson's lease was purchased by the proprietor in 1812 for a life annuity of £800. He spent the last years of his life in Edinburgh, where he died, after a few hours illness, on the 29 January 1815, in the eighty-first year of his age. He had been occasionally slightly indisposed for a year or two before with the same disease (an ossification of the heart) which terminated in death; but the general state of his health was good; and he retained the full possession of his mental faculties till his last moment. He married the year preceding his entry to the farm of Frogden, and has left a numerous family in prosperous circumstances.

Mr. Dawson was exceedingly regular in his habits, and most correct and systematical in all his agricultural operations, which were not only well conducted, but always executed at the proper season. His plans were the result of an enlightened and sober calculation; and were persisted in, in spite of every difficulty and discouragement, till they were reduced to practice. Every one who knows the the obstacles that are thrown in the way of all innovations in agriculture, by the sneers of prejudice and the obstinacy of ignorance, and not unfrequently by the evil offices of jealousy and malevolence, must be aware, that none but men of very strong minds, and of unceasing activity, are able to surmount them. Such a man was Mr. Dawson; and to this single individual may be justly ascribed the merit of producing a most favorable change in the sentiments, in regard to the trial of new experiments, as well as in the practice, of the farmers of Scotland. The laboring classes were not less indebted to this eminent person for opening up a source of employment, which has given bread to the young and feeble in almost the only branches of labor of which they are capable in merely rural districts. Most of his servants continued with him for many years; and such as had benefited by his instructions and advice, were eagerly engaged to introduce their master's improvements in other places. His benevolence, which often sought for objects at a distance that were not personally known to him, was displayed not only in pecuniary donations, while the giver frequently remained unknown, but was strikingly evinced in the attention which he paid to the education of the children of his laborers, for whom he maintained teachers at his own expense. If fame were always the reward of great and useful talents, there are few men of any age or country that would live longer in the grateful remembrance of posterity than the subject of this memoir.

In concluding this hasty sketch of Mr. Dawson's life, and the improvements introduced by him, it is impossible not to contrast, with a feeling of grateful exultation, the present agricultural state of Scotland with what it was when he commenced his operations in Tiviotdale. Did our limits permit, it might perhaps be neither uninstructive nor inconsistent with the present subject, to carry the contrast and the inquiry to even more remote periods; to trace the fluctuations of that enterprising spirit which, on the extinction of the Border feuds, reappeared under a more benignant aspect, to enlighten and fertilize the country its wasteful ardor had so often disturbed. It would be curious, too, amidst those changes to observe what various veins of intellect the same excitation discloses in different individuals, and the mutual influence and relation between the useful and ornamental arts. But we cannot here enter upon such investigations. It is enough to notice, that the same remarkable district, the scene of so many bloody conflicts—which trained to war and tumult the turbulent heroes of Border story—the Douglasses, and Homes and Scotts—can boast, in our own times, a host of names more beneficiently illustrious. The houses of Home and Elliott have produced Lord Kames, Lord Heathfield, and Lord Minto. Of humbler origin, Leyden and Park, with all the indefatigable intrepidity of their ancestors, have persevered, and (unhappily for the world) have perished in the prosecution of far noble enterprises; and the parish of Ednam, which gave birth to the Poet of the Seasons, also produced the "father of Scottish husbandry"—William Dawson.

From the Cultivator.

FRUIT KEPT SOUND IN COTTON.

We have been informed, by a gentleman who has had practical proof of its success, of a new mode of keeping fruits fresh for the table, as grapes, plums, &c. a long time after they have been gathered. It is simply to alternate them in layers with cotton batting, in clean stone jars, and to place them in a chamber secure from frost. The discovery was accidental. A servant maid in the family of William Morey, of Union Village, Washington county, about to visit her friends, secured a quantity of plums in this way, to preserve them till her return. They were found to have kept in excellent condition, long after this fruit had disappeared in the garden. From the hint thus afforded, Mr. Morey, Mr. Holmes, and one or two neighbors, laid down grapes in this manner last fall, and they enjoyed the luxury of fresh, fine flavored fruit through the winter, until the early part of March.

ON THE HABITS OF THE HESSIAN FLY.

To the Editor of the Farmers' Register.

Cambridge, Eastern Shore, Md.,
August 8*th*, 1836.

By the late disastrous ravages of the "Hessian Fly" throughout the whole wheat-growing district of the United States, and the false notions entertained and circulated of the habits of this insect, giving astonishing currency to the most futile, yet strongly vouched remedies, for many years published, and yet publishing to the credulous community, lately in the "Baltimore American," formerly in the "American Farmer," and also in the "Farmer's Register," vol. I., p. 351, (in which latter, I am happy to see in a note appended. you dissent from the hypothesis to which I particularly allude,) I am led to offer a few remarks in opposition to the "prevalent and deleterious doctrine"—"the erroneous principles on which it is founded," and the consequently "erroneous prescription of the much-extolled specific."

An apology cannot be required for discussing one of the most interesting questions that is, or ever has been, before the agricultural community—"a preventive for the ravages of the Hessian Fly."

It is not that I am enabled to settle this mooted point of vital importance that I make this communication, but it is in the hope of *approximating* the *truth*, by the detection of error: and it is thus, "*instar omnibus*," that man, with his finite capacity, must approach and investigate the mysterious modes and results of infinite wisdom. And for the small contribution I now offer to this point, if it meet your approbation, I ask the favor of a space of your "Farmer's Register," where zeal is sanctioned by example, and confidence promoted by liberality.

The author of the communication, lately in the "Baltimore American," signed "Maryland Agriculturist"—"others also to the same effect," remarks, "it," (the Hessian Fly,) "is either generated in the grain of wheat, similar to the bug which infests the pea: or, the insect, when in its winged state, deposites an egg on the surface of the grain, when in the ear; and thus, when the wheat is sown and begins to vegitate, the egg vivifies, and the destructive worm is formed."

He adopts the latter opinion, and makes it the basis of his *remedy.*

His reasons for the opinion are, 1st. "That the insect releases itself by bursting the blade that covers it, when the head is forming, and assumes its winged state, and deposites its egg on the wheat when filling and coming to perfection."

2nd. "That with the aid of a microscope, the egg is discernible in the form of a glutinous matter."

Hence he deduces the remedy which he earnestly recommends to the notice of the farmer, viz: "to pass the seed, through brine or pickle, washing it well, and then roll it in lime."

By what means he does not inform us, he has arrived at the conclusion of this alternative, for the parental selection of a nidus; nor why he rejects the possibility of some other part of the plant being the chosen spot.

Indeed, the hypothesis adopted by this gentleman, and for many years, by others, so ardently, and no doubt so honestly pressed upon the agricultural community, rests upon a concatenated string of errors in fact, "false principles" and "false conclusions," and will lead, if practiced, to infallible disappointment.

It is not a fact, "that this insect releases itself 'by bursting the blade that covers it, when the *head* is *forming*, and then assumes the winged state' from which the writer infers the deposite of its eggs, when the *grain* is *filling.*"

It is a fact, well known, I had supposed, to every wheat grower in the United States, who has noticed the habits of the Hessian Fly, that they have at least *two broods* in the year, the fall and the spring brood, and probably more; the *two* are well known, because of their effects upon a valuable crop; others are not generally known.

The first of the two is *deposited* (or, I will say, "*appears,*") as every one knows, on the young autumnal wheat, where it rests at the base of the blade, till the vegetable juices have nourished it, and the solar beams have matured it, which, in general, does not occur, at least in the climate of Maryland, until between the first and tenth of the following "*May,*" when they are seen, on the wing, over the wheat fields, though in a momentary period, perpetrating their appalling deeds of mischief, by that almost incredible multiplication and celerity of performance, which all the smaller and ephemeral insects are capable of. Their progression, then, from the egg to the "*larva,*" the "*chrysalid,*" and the parent, or winged state, is more or less rapid, as the weather is favorable.

I would ask those numerous and respectable *entomologists,* and *farmers,* who contend that the *grain* is the medium through which the parent transmits the *new progeny* into life, "what becomes of those whose destinies have fixed their first stage upon a period when the *grain* is *not formed?* sct. the "spring," or the "*May*" brood. Will they say that one brood adopts the *grain,* and another the *blade* for a nidus? This contrariety of habit in the same insect is seen no where. It would be repugnant to the "known laws of nature," to "analogy," and to the "character of *instinct,*" which is notoriously *immutable.* Will they unite with us in the apostrophe—"*Natura ! quam te colimus inviti quoque.*"

From the difficulty of accommodating this "*May brood,*" then, it would seem to be deducible, as a matter of necessity, "as they must be accommodated, and *a priori*" in a similar manner as the *fall brood;* and there is then no *grain* accommodation for them, there being no *grain formed at that time;* and yet they continue their procreation, "that the numerous and respectable entomologists, and farmers, who advocate the deposite *on* or *in* the *grain,* are "*quoad hoc*" in error; and their remedy, *consequently* and *absolutely* erroneous, and wholly inefficacious.

It is certain that the deposite must be made upon a part of the plant already *substantial, visible* and *tangible* at the time, but the "*May*" deposite finds no grain in this condition; and the dogma, "that it *must* be *on* or *in* the grain, *must* be abandoned as wholly untenable; and some other part of the plant must be sought as the selected spot of the deposite. I will presently show that this part is the blade.

2nly. The writer says, "if I had any doubts on this subject, they would be removed by the fact, that with the aid of a microscope the egg is discernible in the form of a glutinous matter."

What egg? I would ask. He has not attempted to show or to make it probable that the egg of the Hessian Fly has ever been seen on the grain of wheat, or on any other grain. If it can be shown that the grain was *ever* its resort, then it will be conceded, that it *always was* and *always will* be its resort; if the blade, the same: *reason* may be variable, but *instinct* never changes—the "*curculio*" will take his *fruit*, the "*aphis*" his *leaf*—they will perish rather than violate the laws of their nature, their physical and innate character. The eggs seen may have been the eggs of other insects. I have for some years observed a small, gaunt blue fly, very similar to the house fly, but much smaller, operating upon the head of wheat when nearly ripe, and apparently depositing eggs. I have found upon these heads, afterwards examined, and within the capsule, small larvæ which had consumed a portion of the grain. These are, possibly, from the fly the northern States are complaining of; and the eggs the gentleman has seen on the grain, may have proceeded from the same source. They have never appeared here in sufficient numbers to excite alarm, and they certainly are not the product of the Hessian fly. Having already shown that the head, or grain of the wheat cannot possibly be the place of deposite for the Hessian fly, I will proceed to verify my promise in a manner which I hope will be satisfactory to make it conclusively certain, that the blade of the plant is the place of deposite for the egg. I shall annex the authority, because thereby a responsibility is offered; and consequently, an additional sanction given to the verity of the facts. This is the more necessary, because of the importance of all facts, regarding this important subject matter; and especially such as may preserve the farmer from a fallacious confidence in a proposed remedy, which must inevitably disappoint his hopes, lull him into false security, and possibly suspend his further enquiries into a subject, whose vital importance requires incessant and united prosecution.

On the seventh day of "*May*" last, (a warm day, so noted on my agricultural diary,) I observed in an outer corner of one of my wheat fields, a cloud of insects, on the wing, swarming like bees, over a space of a few acres of the young wheat. Attracted by their dense and glittering appearance, increased, no doubt, by the bright solar rays reflected from them, I rode up to the swarm, whose elevation reached from the ground to about fifteen feet. I caught several, and found them to be the Hessian fly. On that day week, (also a warm and bright day, the intervening days had been generally, cool,) I took a microscope to the field, and pulling up several bunches of the wheat within the sphere of their flight, I discovered on many of the blades of *every* bunch, and on their upper surface, and a few inches from their insertion into the stem, agglutinated eggs, and larvæ invisible to the naked eye until the point was indicated by the instrument, when they might be seen in different stages of forwardness or progression to maturity: some *white*, in which no insect could be discerned upon breaking them—some *yellow*, in which insects were found—and others, from which they were recently released, and lying at the mouth of the shell, yet motionless, apparently, and with their heads turned downwards, as if to make their way as soon as they could move to the base of the blade, at which, finally, the too visible fattened, and grown larva, and chrysalid, give woful evidences of the source of their life and nutrition, and of the decline and death of the great object of our care and attention.

Having made these observations, I extended my researches through the apparent sphere of their operations, and found it equally infested: these few acres became entirely naked; and it is remarkable that no other part of the field afforded any vestige, *then* or *afterwards*, of the fly. Upon the remainder, I grew a heavy crop of straw—the grain was destroyed by the general, and subsequently disastrous scab. Many of the chrysalids I have brought to maturity, leaving no doubt of the identity of parent and offspring.

From the whole premises—"from facts"—"from reason"—from "analogy" it is clear, that the leaf of the plant, and not the head or grain is the *fit* and *actual* nidus of the Hessian fly—it is *there* that it is deposited, hatched and matured: and probably in several successive generations from the first suitable stage of the autumnal wheat, until, by its growth it is rendered too coarse for the functions of the tender offspring, when, no doubt, they renew their deposites, perhaps sparsely, on other tender plants, their next preferences, till their favorite growth of the coming autumn, shall complete the cycle.

The general character of the instinctive faculty, in other insects, better known, for the preservation of their broods, under the influence of which, they seek a nidus, in or near which, their progeny, when hatched, may be nourished—the fact, never I believe denied, that the larva of this fly has always been found at or near the base of the *leaf*, and never *on* or *in* the *grain*, or the *head*—the fact, that the grain or head does not exist at the time of the "*May*" deposite—the fact, that the larva of this fly does not consume any part of the grain or head, nor leave any trace of even a transcient existence in that portion of the plant—the fact, that if the egg were deposited there, the grain, when thrashed, undergoing its necessary heat, would, "as with the moth" or wheat weevil, vivify its *incumbent*, occupying so delicate a shell, which is alledged by these theorists to be afterwards brought to life by a *less degree* of *heat*, in the earth, after the cool season of seed time—the fact, that if deposited and hatched *on* or *in* the grain, it must in its tender larva stage feed *there* or perish, and the fact, that it does not feed *there* and does not perish; all these facts undeniable, together with those stated, as coming under my late observation, can leave no reasonable doubt, that the place of deposite for the egg of the Hessian fly, is the *leaf*—and *not* the *grain* or *head*, and demonstrate the absolute futility of the brining and liming remedy, so confidently and earnestly relied on, and recommended for many years; and to the present moment reiterated with ejaculations of surprise, "that so simple and infallible a remedy, (see Farmers' Register, vol. I.,) should not be generally circulated and adopted for the good of mankind."

Finally, I may remark, that I used this process of brining and liming for three years, not for the "fly," but for the smut (*le charbon*) a stinking, contagious pest, very different from the black head, (*la nielle*,) which latter is, with us, generally and improperly called smut: of the former, we have had but little; yet, for a few years, by some unknown cause, it was introduced among my wheat. I found this remedy unavailing also for this disease; and my crops were not relieved until I purchased a new stock of seed wheat and scoured my granaries. In one of these years, it happened, that my crops, thus treated, suffered as much, perhaps more, than in any previous season: and from these experiments, (which were fully and faithfully executed, and on a large scale, because I entertained sanguine hopes of success,) I am under the fullest conviction, that the germinative principle is enfeebled by the process, and the plant rendered thereby an easier prey to the fly, or any other invading insect.*

I have, my dear sir, far exceeded the limits of my design in this communication; but really, the question of a remedy for the Hessian fly is so interesting—the detection of a prevalent error in respect to it so essential to its true solution—the chief remedy offered is so confidently pressed upon the public, and so palpably worse than nothing, inasmuch as it holds out false views, and obscures the path of research, coming too under the sanction of many and highly respectable sources, from New York to Virginia, inclusive—these considerations make my apology for the zeal which I have evinced, and the freedom which has been taken, by

Yours respectfully,

JOSEPH E. MUSE.

ON THE RAIL-ROADS OF NORTH CAROLINA, AND THE SOUTH GENERALLY.

To the Editor of the Farmers' Register.

To the fact of my not having, until nearly half August had expired, seen the reply of P. Q., [in No. 3, vol. 4, of the Farmers' Register,] must be attributed my silence on the subject. I really did not intend to be harsh or unpleasant. The paper was written *currente calamo*, and perhaps, rather severely expressed; if so, it was owing to my having been charged, *in imagination*, with "dealing damnation" around me, when as to the Wilmington, &c. road, *in reality* P. Q. was in a similar manner, doing the very same. The paper alluded to was sent to Wilmington with a view, I candidly confess, of counteracting his malediction. Whether it appeared or no, I am ignorant. The Rip-van-Winkle presses are strangely conducted, and, as well as the good citizens of Wilmington, *fearfully* inspired. They will understand, if they see this.

I plead guilty to the charge in his 3d paragraph; and, considering the actual condition of the south, and the attempts of Baltimore, &c., &c., to convey the produce, and carry on the commerce of the west, to the Patapsco, the Delaware, the Hudson, and last, but not least, the St. Lawrence, still think the "prejudice" with which I am charged justifiable, and rather a subject of congratulation than of condemnation—certainly *now* in Virginia, *eventually*, with Rip himself.

We agree as to the "vast chain of public works;" and I repeat it, I still rejoice in the success of the Gaston Rail Road—for, such I presume, is the result, but I will candidly confess I have not yet learned the road is in progress, which, *possibly* would have been the case, if the subscription had been completed. I am necessarily ignorant of what is going on, in either North Carolina or Georgia, as it most especially suits the Charleston—in *fact*, the only presses of South Carolina—to keep all that those states do, or attempt to do, perfectly out of sight—always excepting when it affects the interest of the "Emporium of the South" that *is to be*

P. Q. asks me, if "ever *my* pen can stop the march of the work," the great rail road to the south? In reply, I would ask him when and whether the road is to be continued to Fayette, &c., &c.; and if continued, is it likely to be as soon in operation, as the road from the Tennessee line, &c., to Baltimore. In this state of things, I cannot argue the matter; but notwithstanding *his* argument is so plausible, I *still* believe, that a "line from Darlington, &c., would make travellers forget that Raleigh was in existence." P. Q. "*supposes*" the Raleigh route extended south, and then asks my opinion as to the comparative merits of the two routes. I reply, that the Weldon, Halifax, and Waynesborough, is yet my favorite route. The road through Raleigh, Fayetteville, Cheraw, Camden, Columbia and Augusta, cannot be made at any thing like so cheap a rate, or accommodate any thing like so wealthy and wanting a country, as that pointed out by Col. Long. The one will suit pedlers, the other planters. Except on the river banks, in this *Carolina deserta* route, there is no valuable cultivation. Above and below it, there is very much. P. Q. speaks of "the frequently disagreeable and sometimes dangerous passage across the Chesapeake." This will vanish when the road is made, down the Eastern Shore, to the point opposite Norfolk. It will give an agreeable variety, and make Philadelphia, &c. &c., as accessible as Richmond or Wilmington. It is to the former the multitude *will* direct their steps.

I have not your Register by me, and with a frail memory am unable to get at the point of P. Q.'s last paragraph. It should seem my object was general. It was written under a strong feeling that something should be done, and "done quickly." The north has capital, can command nerve, and possesses energy. Louisville is uniting with Baltimore, and N. Orleans with Louisville; and, if the Planet, with her wrought iron rimmed wheels, is to carry a load of 333,000 lbs., I have no hesitation in saying, that the cotton of Tennessee, and upper Alabama *certainly*, and that of Louisiana *possibly*, is destined, ere long, to find its way to Baltimore, Philadelphia, &c.—indeed, already have 100 bales, in one parcel, found their way to the latter place, by way of the Schuylkill canal. And, if, as in the case of flour, &c., John Bull will receive the cotton of the west as *Colonial*, receiving *vice* the duties, the advantage of the exclusive carriage, much of it will reach Liverpool, *via* the St. Lawrence.

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* From our experience of brining and liming seed wheat, to prevent the smut, we have arrived at a different opinion from Dr. Muse—as we have never known that disease to occur after the preventive process had been "fully and faithfully executed." Still we admit that such negative proofs, are not conclusive, as possibly some other unknown causes may have checked or prevented the disease. In another opinion expressed above, we are much disposed to concur—that is, that the process of brining and liming, (at least as usually, and perhaps carelessly, executed,) serves to weaken the germinating power of the seed, and thereby enfeebles the plants. Ed. Far. Reg.

If "*there's on earth the man I hate*," it is a demagogue. It is one of that "*malignum vulgus*," whom I abhor. Hence, I must only state my regret that P. Q. should have so *expressed himself* as to make him think my *expression* tended to support such a mockery of patriotism and common sense. He seems to believe he had "sufficiently guarded himself"—perhaps he did—if so, and indeed in any case, I can only plead guilty and claim his excuse. Of monopolies and joint stock companies I have a horror, so perfect as to be prevented speaking of them with patience; but, sustained as they are by wealth and influence, and cramped as is the press by that wealth and influence, it is in vain *now* to say a word. However, I apprehend the subject will be given its real importance and a fair hearing at the next New York Legislature, when the bank-restraining act will come into discussion, and its principle combated by the report of the practical benefits to be derived from the only true joint stock system, as successfully adopted and used in England since 1825.

That with Col. Long's Report before it, and an overflowing treasury, some measure founded on the report was not proposed in Congress, surprised me. The result of a rail road made on the route and in the manner he proposed, would have saved hundreds and thousands of dollars, and hundreds of lives in the late Creek business. I should like no better witness than General Scott on this subject. * * * * A rail road from north-east to south-west, would convey the United States mail troops, &c., &c., free of charge—a consideration fully entitling its proprietors to a fair claim to a construction of two-fifths of it by the government: thus adding to the convenience of the government, and in such a manner and extent, as to give it no pretence for interfering with its management, or expecting to participate in its profits—moreover lessening its influence.

G. L. C.

[We regret that, in addition to the delay of the foregoing piece caused by the reasons stated by its author, at its commencement, it should have been still longer kept back, by want of room in the last No.—the pages of which were either then filled, or engaged by other matter, when this communication was received. By such long intervals occurring between different pieces of the same series, whether by the same writer, or by opposing controversialists, much of the interest is necessarily lost. To lessen this effect as much as possible we shall commence in the present case a course which will be continued hereafter, whenever circumstances require and permit it to be adopted—viz. to send a sheet containing any matter of controversy, as soon as printed, to both parties—and thus to afford earlier opportunity for reply.

We have before stated our desire to receive communications of the class to which these (on both sides) belong—that is, statements and arguments in explanation or support of any of the schemes of great and valuable public works for facilitating transportation. But at the same time we must remind our correspondents of the necessity of confining themselves to the discussion of the subjects undertaken—as well as of choosing subjects of sufficient importance to interest a considerable portion of our readers. The conflicting claims of both the great lines of railways advocated respectively by P. Q. and G. L. C. are certainly of high importance: and if our correspondents choose to continue the discussion, we recommend to them to commence a new series, in which they may set forth fully their views on the general subjects, and avoid, as either unnecessary or improper, all minor or irrelevant, and especially all personal matters. For the purpose of having a full exposition of the subject, and rendering justice to both sides, we shall give in the following pages the views of the proposed Wilmington and Halifax railway and its general route, as presented in the Engineer's Report, just published.]

From the Richmond Whig.

COPPER IN VIRGINIA.

The copper region of our state is beginning to excite a great deal of interest throughout the country, and it is a subject well worthy the attentention of scientific and practical men. The importance of this subject will readily be perceived, when we recollect that the demand for copper is almost unlimited, and constantly increasing, arising from the new uses to which it is almost daily being applied, and that copper mines are among the most certain and profitable of all mines. The last annual report of the consolidated mines in Cornwall, states the value of the products of that mine, for the last year, to be (£152,000) one hundred and fifty-two thousand pounds sterling: they employ three thousand five hundred laborers, and steam power equivalent to seven or eight thousand horses, and are now working at the depth of more than 1600 feet below the surface. The average yield of the ore from that mine is between 8 and 9 per cent of copper. The analysis of the copper ores of this state show them to be much richer, and lying nearer the surface, they can certainly be worked to much greater profit. There are two copper mines in this state, one called the United States, situated in Orange county, and the other the Phœnix Mine in the county of Fauquier, which are attracting considerable notice. There has as yet been but little work done at the United States, but a company has been recently organized and will speedily commence operations, under what are believed to be very favorable auspices. The Phœnix Mine was worked to considerable extent, many years since, by an English company and a large quantity of ore taken from the mine, and shipped to Europe. That company were forced to abandon the enterprise owing to the impossibility of keeping under the water with the imperfect machinery of that early day. A party of gentlemen have recently undertaken to work this mine. An engine has been erected to free the mine of water, which it easily accomplishes: skilful miners have been employed, and it is hoped the work will be prosecuted with vigor. The ore taken from the mine since the present company have commenced operations, is very rich and beautiful, and the prospects on the whole are very flattering. They have unwatered the mine, and ascertained that the vein is of regular formation and sufficiently large.

We have seen in this city specimens of the ore of the Phœnix Mine, and they are of extreme wealth undoubtedly. They are now undergoing analysis by Dr. Johnson, and we may state the result at an early day.

The early history of the Phœnix Mine is curious. It was worked some 15 or 20 years before the Revolution, and the ore sent to England to be smelted. Its richness may be conjectured from its bearing transportation across the Atlantic, and still paying profit.

There is, we are happy to say, a deep interest beginning to be taken in the mineral wealth of Virginia, and a spirit of active enterprise displayed in developing it. For the gratification of the curious, and in the hope of impelling forward the spirit now awakened, we throw together the following *data* as indicating the value of the Phœnix copper mine. They have been prepared on careful inquiry, and we believe may be received with confidence.

1. It is proved that there is a regular well defined vein, the absence of which, it is believed, has prevented the success of any copper mine yet undertaken in America.

2. This vein is from two to five feet in width, which in Cornwall would be considered very considerable.

3. The vein cuts the formation at a high angle, and when that is the case, it never gives out in depth.

4. No reliance can be placed upon any mine, however favorable the superficial indications, when the existence of a regular vein cannot be demonstrated.

5. The vein is not only free from any admixture which might injure the copper, or render its reduction difficult, but actually contains an abundant quantity of limestone, the substance employed for its flux.

6. The ore is exceedingly kindly and rich, and will bear comparison with specimens from the famous mines of Cuba and Chili.

7. Considerable quantities of ore have been taken from the mines and shipped to Europe, as is proved by the refuse left on the surface, and the testimony of numerous traditions.

8. In England, few copper mines are productive for the first few hundred feet, whereas this one has yielded much fine ore about that of fifty.

9. The present formation, which is intersected by the vein, is superficial. This is the opinion, expressed with great confidence, of Professor Rogers, who states that the copper has come from beneath where the regular mineral formation will be found after penetrating through the upper horizontal strata.

10. The vein is probably of desirable length, as specimens of ore have been found upon its course at a considerable distance in both directions.

11. The property includes nearly a mile upon the supposed course of the vein.

12. The existence of a branch at the depth of fifty feet makes it probable that there are other veins—parallel veins. It is rare that a single isolated vein is found.

13. The mine is but 25 miles from tide water, and four from a canal now in process of construcstruction.

14. There are roads and settlements, and above all, abundance of wood in the neighborhood.

15. The mine is in actual operation—a steam engine and ample mining materials are upon the spot, and an opportunity will soon be furnished of obtaining any additional machinery of the most improved kind in the immediate neighborhood.

From the Genesee Farmer.

STACKING HAY.

The plan of stacking hay is one which is not to be commended in itself, and which should be avoided by every farmer as much as is possible with the other arrangements of the farm. The reasons which to us are conclusive against stacking where it can be avoided are these: The outside of the stacks, forming no inconsiderable part of the whole, by exposure to the weather becomes utterly worthless as fodder—in feeding it out, much of the hay is blown away, or trodden down by the stock, and is thus lost, that would be saved were it fed from the rack or in the yard—the manure is not at the command of the farmer, and of course cannot be applied to those parts of the farm that most require it, and to those crops that would be the most benefited; and when the stacks are made in the meadow, as they most generally are, the turf all around them is poached up by the feet of the cattle, and the surface rendered uneven and unfit for mowing. Besides, hay fed out at the stack will not go near as far as when fed in stables or warm yards, nor will the stock receive the same benefit.

Still, stacking hay to a considerable extent *must* be practiced for the want of barn room, and where it is thus necessary, the best means of doing it should be adopted. If it is intended that the hay shall be sold, the larger the stack is constructed the better, as the surface exposed is always less in proportion to the size. If it is intended to be fed out where stacked, smaller stacks will be preferable, as the loss from injury by the weather will be more than compensated by the greater distribution of the manure, and the less permanent poaching of the ground. The better way of making these ordinary sized stacks, is to lay up a square pen of sound rails to the height of six feet; on the bottom tier of rails let others be laid across at little distances to serve as a flooring for the stack; let the top rails be well secured at the corners by notching or otherwise; a pole of suitable height, if desired, planted firmly in the centre, and the pen is fit for use. If the stack is well laid up, it will project over the rails all around, to the distance of two or three feet, thus entirely screening the lower and more solid part of the stack from the influence of the weather, and is at the same time completely fenced against cattle and sheep. Such a stack may easily be made to secure three tons of hay, which is as much as can be beneficially fed out at one place, to an ordinary stock. After a stack is laid up the requisite height, and topped off, great care should be used in throughly smoothing and raking the surface downwards, so as to prevent the action of rain and weather in the best manner. We have seen stacks so constructed, that the rain was thrown off with almost as much certainty as from a shingle roof; and others, the outside of which was so arranged as to invite the moisture to enter, instead of warding it off. In stacking hay, English farmers generally show more skill than

American ones. This skill and care, derived from custom and experience, it would be well for us to imitate.

G.

From the Silk Culturist.

AGRICULTURAL JURISPRUDENCE.

In the case of Greenleaf *vs.* Francis lately tried and decided by the Supreme Judicial Court of Massachusetts, a question of agricultural jurisprudence was presented and settled, which ought to be known to every farmer. The defendant sunk a new well in his own land, but so near the land of the plaintiff as to draw away the water from his, the plaintiff's well, for which the action was brought. It appeared in evidence, that the plaintiff's well had been supplied by a natural subterranean current, or spring in the defendant's land, and that by digging the new well, the defendant had diverted it from its former course. The court decided the defendant had a right to dig a well on his own premises, and if the plaintiff's well was injured thereby it was a damage without any injury.

From the Genesee Farmer.

DRINKS IN HARVEST.

One of the greatest triumphs of the temperance reform, and one, the beneficial influence of which is most felt by the farmer, has been achieved in the harvest field. Where spirits have been banished, we no longer see such shocking work made by the *sows and pigs*, (as a facetious farming friend, strongly attached to the sickle, persists in calling the cradle,) among the wheat, and the greater quantity of grain saved, and the superior neatness of the work done, should induce every farmer to exclude alcoholic drinks at once from his fields. We have seen the time, when about four o'clock some of the laborers might be seen snoring under the corners of the fences, or the shadow of a wheat rick, laid by, by the spirit of rum or whiskey; and those who continued their operations went whooping and hallowing through the field, throwing the grain about at such a fearful rate, that had Israelitish damsels been gleaning after them, wheat enough in a day might have been gathered, not only to have clothed the fair gatherers in fine linen, but purchased husbands to boot.

But in ridding ourselves of one evil, we must be careful not to run into another. Because we have become temperate in the use of spirits, that is no reason why we should become intemperate in the use of water; and there is reason to apprehend, from the frequent injuries sustained by drinking too much cold water in very warm weather, or when the body is overheated, that such is the fact. Men who labor hard, and sweat freely, must have the means of sustaining perspiration, or nature soon becomes exhausted; they must drink and drink freely, and it would be well if something could always be taken which would not only assuage the thirst, but afford permanent benefit. If some little pains, or a little expense, is necessary to accomplish this, the farmer will find himself, in the end, well rewarded. Good beers, of which hops and molasses are the active ingredients, are easily made, and make excellent drink. Milk and water is preferred by many, and combines in a good degree the above desired qualities; water to which a small quantity of oat meal has been added is used in Scotland to some extent, and its use has been introduced into this country; but perhaps the drink most profitable to all, the most effectual in quenching thirst and the least liable to produce injurious effects, is cold water made sufficiently sweet with molasses—maple is the best—a little ginger of good quality stirred in, and a little acid of some kind, lemon juice, or even common vinegar, added to suit the taste. This makes a pleasant and healthy drink, worthy of trial

G.

REPORT TO THE THIRD ANNUAL MEETING OF THE STOCKHOLDERS OF THE RICHMOND, FREDERICKSBURG AND POTOMAC RAIL ROAD COMPANY.

June 20, 1836.

In conformity to the act incorporating the stockholders of the Richmond, Fredericksburg and Potomac Rail Road Company, the President and Directors who were appointed on the 20th day of June, 1835, render the following account of their proceedings to the stockholders at their annual meeting, on the 20th of June, 1836.

In the last annual report of the stockholders, it was stated that a line of railway had been located between Richmond and the Mattaponi, superior even to the sanguine anticipations of the board, and the execution of which it was ascertained, would be effected at a considerable reduction from the first estimate of the engineer. The hope was expressed that the examinations then making between the Mattaponi and Fredericksburg would result in improvements equally important, in which case it was confidently anticipated that the whole expense of the work to Fredericksburg, including the cost of depots, warehouses, and water-stations, locomotive engines, cars and carriages, would not exceed an aggregate sum of $650,000 instead of $763,182 21 cents, the first estimate.

The hopes of the board as to a diminution of expense in the location of this last portion of the line were realized only in part, and since the last meeting of the stockholders, a great enhancement has taken place in the prices of labor and provisions in every portion of the country. This enhancement has been probably less felt in Virginia than elsewhere, but it has still existed to a sufficient extent to make it necessary to add to the contract prices of much of the work. From the above causes, the whole expenditure for a rail road and for moving power, whilst it will still be considerably within the first estimate of the engineer, will exceed what, at the last meeting of stockholders, it was hoped would cover it. As far as the board can now judge, the whole expenditure to Fredericksburg will not vary materially from an aggregate sum of $730,000.

On the 13th of February last, the road being then ready for transportation from Richmond as far as South Anna River, it was thought expedient to open it for use to that point. The whole of the first division, extending to the North Anna has been in use since the 15th of last month. Within a few days past an additional portion has been completed, and passengers and produce are now conveyed on the road to Chesterfield in Caroline county, about half the distance to Fredericksburg. The board entertain no doubt that by the first of August the road will be opened to the depot near the Bowling Green, and confidently anticipate its entire completion to Fredericksburg in the course of November.

The advanced state of the work of course makes it necessary to call rapidly on the stockholders. Before the date of the last annual meeting only $25 a share had been required. Since then the board by a resolution of the 1st of September, called for $25 a share, payable in instalments of $5 each, on the 10th of each of the ensuing five months. On the 8th March, a further call was made of $10 a share, in two instalments, payable on the 15th of the two succeeding months. And by a late resolution of the 26th of May, the residue of the capital stock, being $40 on each share, has been required to be paid at the following times, to wit: $5 on the 20th of June, 15th of July, 10th of August, 1st of September, October, November, December and January. The punctuality of the stockholders, hitherto almost without exception, furnishes an assurance that the late call will be punctually met. As however it will be desirable that the amounts called for should be received even earlier than they have been asked, the board have determined to allow to stockholders who may anticipate their instalments, interest on the amounts advanced by them until the periods when the same would be payable.

Since the last annual meeting, the Board of Public Works has subscribed to the stock of this company for the amount authorized and required by the Act of Assembly, passed January 23d, 1835, and upon the terms and conditions specified in that act; and the Board has accepted the subscription so far as it was authorized to accept it. To obviate all dfficulty arising out of the circumstances of the subscriptions by the individuals exceeding three-fifths of the capital stock by forty-eight shares, an act of Assemby was passed on the 23d of March, 1836, declaring that the subscription by the Board of Public Works should be considered as a subscription for forty-eight shares less than two-fifths of the capital stock: that is to say, should be considered a subscription for 2752 shares, and relinquishing all claim of the Commonwealth to any greater number of the existing shares. By the terms of the act which authorized the subscription, the Commonwealth was not to be called on for more than $110,000, during the year 1835, nor more than $120,000 during the year 1836. Consequently, there will be a sum of $45,200 on account of the Commonwealth's subscription, which cannot be received until after the first of January next. As before that time the whole line to Fredericksburg will have been completed, and the whole capital wanted—the President and Directors think it probable that it will become expedient during the year to make a temporary loan. From the good standing and credit of the company, they entertain no doubt at present that any amount which may be required, could be obtained on a mere resolution of the board. But to guard against any difficulty in this respect, it might perhaps be advisable for the stockholders to authorize the board to make a loan, and give a lien on property, if found necessary or expedient, for the payment of the sum borrowed, and its interest.

An account of the disbursements of money, since the last annual meeting, has been made out according to the charter, and will accompany this report. The Treasurer has also been directed to prepare statements showing the amount of revenue received each month since any portion of the road has been in use, and the source whence derived, whether for stage passengers, local passengers or freight. Such statements, it was thought, the stockholders would probably desire to have printed along with this report for their use.

From these statements it will appear that from the first 26 miles of the road the receipts during the last month were about $3300. It is believed, that on the portion of the road now in use, being as before mentioned about one half, they may be moderately estimated for the remainder of the year at $4300 a month, or $51,600 per annum. Estimating the expenses of transportation and repairs at 50 per cent. of the gross receipts of the company, a proportion which the experience of the Petersburg and Roanoke Company shows to be abundantly sufficient, a nett profit will remain to the stockholders on their present business equal to an interest of between 7 and 8 per cent. on the cost of the first half of the road.

The anticipation at the last annual meeting that it would be in the power of the board, if deemed expedient, to declare a dividend to the stockholders in little more than twelve months from that time, may now be considered as realized. It has occurred to the board, that it would probably best suit those stockholders in this company who are also stockholders in the State Banks, to receive their dividends from this company at other periods than January and July. They contemplate declaring the first dividend on or before the 1st day of November next, and thereafter semi-annually.

The first dividend, though at the rate before mentioned on the cost of that portron of the road which shall have produced it, will be nominally small per share. It will however be not less than $2 on each share. Probably it will be more.

The board now feel that they hazard nothing in saying to the stockholders that their expectations of productiveness from the work, at the time it was embarked in, will be more than realized; that instead of a dividend of 8 or 9 per cent. a year on the cost of the road, at the expiration of the first twelve months from the period of its completion, one of 10 per cent. may be confidently reckoned on.

Gratifying as these results are, the prospects of the company are still more flattering. It was mentioned in the last annual report that a branch rail road had been projected from the neighborhood of Taylorsville to the south-west mountain. An act incorporating a company for the purpose of making the road, was passed at the last session of the legislature. The board entertaining the opinion that the construction of this road would add largely to both the trade and travel of the road committed to their charge, deemed it advisable to aid so far as they could in forwarding the object. Believing that nothing could be done better calculated to advance the measure than a declaration of the course which would be pursued by this company in regard to the trade and travel passing from the one road upon the other, the board on the 20th of April last, came to a determination on this subject which has given general satisfaction to those who were inclined to embark as stockholders in the Louisa road. The board declared that upon being informed by the Louisa Company of the tolls charged upon the Louisa road, it would adopt their tolls as the tolls of this company for the transportation of persons, produce, merchandize and other goods received from or delivered upon the cars of the Louisa Company at the point of connection, and charge for the same only so much per mile as might be charged on the the Louisa road, with this proviso, however, that the rates fixed by the Louisa Company be such as to enable that company after the payment of all necessary expenses and setting apart a fair and reasonable sum for renewal and repairs as required by their charter, to divide at least six per centum per annum on the capital stock invested in it. Books have since been opened; more than enough to incorporate the company has been subscribed; the president and directors appointed, and other measures taken for going on with the work. The accomplishment of this work will bring upon the road committed to the board not only the travel between the West and Richmond, but the travel between the West and Fredericksburg, a large amount of local travel and an extensive trade in produce and return freights, all of which will be sources of profit to the stockholders in the two roads, and of benefit to the city of Richmond.

A company has been recently organized to make the railway between Richmond and Petersburg of which mention was made in the last annual report; the location of the road is now going on, and the work itself, it is understood, will be speedily commenced. The execution of this work may be expected to add largely to the amount of northern and southern travel upon the road under charge of the board.

In addition to these improvements, another, the Raleigh and Gaston Rail Road, not contemplated at the last meeting of the stockholders, but which, if more remote, will be not less advantageous in its influence on the improvement committed to the board, has been lately undertaken.

With these additional and important sources of profit, it may safely be presumed that the work committed to the board, will on the completion of the roads just mentioned, if not sooner, realize the maximum of fifteen per cent. allowed by the charter to the stockholders.

Viewed in this aspect, the right to increase the capital stock $300,000, with the privilege to the individual stockholders of taking the additional shares, imparts greater value to the stock now held by individuals. The company has power to extend the road, should it deem it advisable to do so, from its point of termination within the town of Fredericksburg, to the Potomac River or some creek thereof. Whilst it may be preferable in one point of view, to defer increasing the capital until the present stockholders, generally, can find it convenient to avail themselves of the privilege reserved to them, it will evidently be desirable to make the increase of capital soon enough to insure the completion of the road between the Rappahannock and Potomac by the time at which the improvements above named will probably be in operation. Before this road can be constructed, it will devolve on the board to cause two preliminary surveys to be made, one to Aquia Creek, or a point contiguous thereto, and the other to Potomac Creek, or a contiguous point. These and some other preliminary measures the board contemplate taking during the present year. Should the stockholders at the present meeting declare that they deem it advisable to extend the road to the Potomac, the board would probably deem it expedient prior to the next annual meeting, to increase the capital stock of the company to the extent authorized by the charter, as the whole amount will probably be required for the purpose of executing the portion of the road just mentioned, and for providing the increased number of locomotives, cars and carriages which would be required for its increased trade and travel.

Soon after the last annual meeting, an arrangement was made with the Bank of Pennsylvania, whereby facilities are afforded to persons residing in Philadelpha or its vicinity, for making transfers of stock in the mode suggested in the last report. The Philadelphia stockholders deposite their instalments in the same bank, and will there receive dividends on their stock whenever declared.

The president and directors cannot close their report without calling the attention of the stockholders to the necessity of a more efficient organization of the company. As one step towards it, the office of Treasurer and Clerk has been placed contiguous to the depot, and the late Treasurer, not being able, after this change of location, to continue in the office consistently with the duties of another station, and having in consequence resigned, Mr. Hilary Baker has been appointed in his stead. Another measure of more importance is deemed indispensable. Relieved, as the president, has been, in a great degree, by one of the directors, who has acted in the country, as an agent of the company, and by another director residing in Richmond, who has aided as far as he could in preparing business for the board, and attending to the finances of the company, the president has still found more of his time occupied by the duties of his office than he could conveniently devote to it, and has been desirous of resigning for some time past. He has deferred resigning thus long because it was thought preferable by the other members of the board, as well as by himself, that the appointment of his successor should be made by the stockholders in general meeting. The board cannot forbear to mention that while the duties properly devolving on the president have heretofore been very considerable, they are still on the increase, and upon the manner in which they shall be discharged, the prosperity of the company most essentially depends. Necessity therefore exists for adopting means similar to those taken by the Petersburg and Roanoke Company, to procure for the office of president an individual who will be able to give to the office all the time that will be necessary, and to discharge the duties of the station in such a manner as the interest of the company require.

All of which is respectfully submitted,
By direction of the Board.
JOHN A. LANCASTER,
President.

WILMINGTON AND HALIFAX RAILWAY.

Extracts from the Report of Walter Gwynn, Esq., Engineer, to the President and Directors of the Wilmington and Raleigh Rail Road Company.

GENTLEMEN:—I have the honor to submit the results of the reconnoissances and surveys, neccessary for the selection of the route of the contemplated rail road between Wilmington and Halifax.

A careful examination of the country led to the adopton of the following lines for survey:

Western Route.

This route commences at the "Dry Pond," in the south-east suburbs of Wilmington, thence running nearly due north to the head of market street, it takes an easterly direction to a favorable site for crossing Smith's Creek at "Love Grove." After crossing Smith's Creek, the route passes over a level plain, only broken by Prince George's Creek, which it crosses between Mr. Burgwin's dwelling and mill-house, to the north-east branch of the Cape Fear River, near the old bridge. The graduation on this portion of the route, consists of slight excavations and embankments in clean sand, and will be extremely easy of execution. From the Cape Fear, it may be run straight forty-seven miles to Hackleberry Pocosin, at the head of Bear Swamp. Within this distance, the route will cross Rockfish and Stewart Creeks. With the exception of the bridges and embankments across these streams, the surface of the ground is so very level, that the chief work in the road-way formation, will consist of slight cuts, no where greater than ten feet in depth, and embankments from two to three feet in height. The route traverses the ridge dividing the waters of Long Creek from those of the "north-east," and passes about two miles and a half to the west of South Washington; and about seven miles to the west of Kenansville. From the head of Bear Swamp, the country continues unbroken, until the route reaches Goshen; which is one of the head branches of the north-east. Here the first undulation in the plane of the road worthy of notice occurs, a descent and immediately an ascent of 30 feet to the mile is unavoidable, and some comparatively deep cutting, and heavy enbankments are encountered. Immediately on ascending from the valley of Goshen, the route reaches a dry, level, open woods through which it passes to Brook's Branch. The formation of the rail road on this portion of the route will consist, chiefly, in cutting down the large trees which overspread the track, and hewing and preparing them for the reception of the iron rails. After making a slight undulation in crossing Brooks' Branch, which is a very inconsiderable stream, it arrives at the same level, on which it continues to the head of Yellow Marsh; along the margin of which, it descends to the valley of the Neuse River, encountering in its descent, some heavy cuttings, which consist, however, entirely of sand. It crosses the Neuse at a very favorable place—just below the bridge on the stage road from Halifax to Fayetteville—thence passing near Waynesborough, the country wearing the same level aspect, with the exception of the breaks occasioned by the Nauhunta, Acock, and Black Creeks, the surface being almost perfectly smooth. It reaches Contentnea Creek about half way between Woodward's and Rountree's Bridges. After crossing the Contentnea, until the route reaches Enfield, the country may be characterized as bold, compared with the uniform level aspect heretofore presented.

The soil also undergoes some change. From sand, to a substratum of clay, mixed with sand, which will be encountered in some of the excavations. On this portion of the route, Tossnot, Town and Cokey Swamps, the Tar River, and Swift and Fishing Creeks, are crossed. These occasion a multiplicity of low summits, and an undulatory profile. The grades are, however, gentle, and the cuttings and fillings no where exceed fifteen feet. After leaving Enfield, the route gradually descends to a favorable site for crossing Beach Swamp, just below the mouth of Bear Swamp, along the borders of which, with very little variation from a level grade, and no other expense in the formation of the road-way, than the raising of a bank two or three feet in height, the route runs until it reaches Quaukey Creek. Here occurs the highest embankment on the line of the road. It is, however, very short. From Quaukey, which is only a mile from the termination of the road, the route ascends very gradually until it unites with the Halifax and Weldon Rail Road, about half a mile from Halifax, and seven miles from Weldon. At Weldon, the Portsmouth and Roanoke Rail Road crosses the Roanoke River by a bridge—it also crosses the Petersburg Rail Road about two and a half miles from Weldon, where the two roads can be easily united; and thus a connexion of your road may be formed with the Petersburg Rail Road, or by the steamboats which now daily ply between Weldon and Blakely, they may be connected. In any event I can see no difficulty in the way of both passengers and goods, destined for Petersburg, passing from your road to the Petersburg Rail Road, with as little delay and inconvenience, as to the Portsmouth Rail Road.

A description of the line which was run on the west side of Long Creek to Bear Swamp, and which will be brought into comparison with that portion of the western route, from Wilmington to the same point, will appropriately precede the estimate of the "western route," and will come in here. This line commences at the timber pens, and runs upwards along the margin of the river about a mile; thence it crosses over and passes along the dividing ground between the Cape Fear and its north-east branch, to nearly the head of Long Creek. The road-bed in this distance will be formed of alternate excavations and embankments, consisting entirely of sand. Thence the line will pass on the dividing ground between Long Creek and Moore's Creek; and between Moore's and Rockfish Creeks, and throughout to the head of Bear Swamp, the ground is extremely favorable. Stewart and Turkey Creeks are the only streams that are crossed.

Summary of the excavation, embankments, and superstructure;

69 miles, 1191 feet, at $433,815 97

From this, there should be deducted the cost of six miles of superstructure, at $3,800 per mile, this being the reduction which will occur in the actual location; which leaves $411,015 97, the cost of this line. This compared with the first three items in the following estimate of the western route, and the result in favor of the route on the east side of Long Creek to Bear Swamp, will be in the first cost, $49,593 09; and in distance upon the probable line of location, 4950 feet. A comparison of the grades and curvatures, results in favor of the line on the east side of Long Creek. I have, therefore, based my estimates for the western route on this line, supposing that the same reasons which have influenced me in the selection, may also operate with the board in according it the preference. I have now to proceed with the estimates of the

Western Route.

Summary of the cost of excavations, embankments, superstructure, Locomotive Engines, Coaches, Cars, Water Stations, Wharves, Shops, Contingencies and Steamboats:

161 miles—3189 feet of rail road, and 150 miles of steam boat communication, $1,500,000.

Careful and minute enquiries with the view of ascertaining the practicability of a route through Rockymount, and also through Kenansville, by Rockford, resulted in the conviction of their being less eligible than either of the routes selected. It now remains to describe the character of the

Eastern Route.

This route pursues the trace of the western route to station No. 176; thence it takes a more easterly direction, and traverses the ridge dividing the waters of the north-east branch of Cape Fear River from those of the New and Neuse Rivers, until it reaches the Neuse at Rockford. On this portion of the route, we cross Smith's and Prince George's Creeks, and several small streams, which make in the north-east. The general aspect of the country is extremely level and favorable to the contemplated work. From Rockford to Edward's Bridge, where the route crosses the Contentnea, there are no difficulties or streams to cross worthy of notice. From Contentnea the route ascends gradually to a level which is maintained for several miles; when it descends to effect a favorable crossing of Town Creek; thence several undulations are necessary in crossing small streams, until the route reaches Tarborough. Thence a level grade may be had entirely across Tar River. A favorable site for crossing which, is found about a mile and a half north of Tarborough. Thence the route alternately ascends and descends to lessen the excavations and embankments in passing Deep Creek, Connecanary Creek, and the ridges between them, until it enters the western route five miles from Halifax, which it pursues to the Halifax and Weldon Rail Road.

Summary of the cost of excavations embankments, superstructure, Locomotive Engines, Coaches, Cars, Water Stations, Wharves, Shops, Contingencies, and Steamboats.

162 miles—1504 feet of rail road, and 150 miles steamboat communication, $1,512,853 80—makng the whole line of communication, by rail road and steamboats, 312 miles.

This shows a difference in cost in favor of the western route of 12,853 80. A comparison of the grades, length of curvatures, and straight lines exhibits also a slight difference in favor of that route. On the eastern route, however, there will occur a thousand feet less bridging, this, in the annual repairs of the road will operate in its favor, by lessening the amount some four thousand dollars per annum. The superiority of the one line over the other, in a professional point of view, is so very slight that an expression of my preference under this head, could not be a decision of the question of choice between them. The board may, then, consider that I lay the routes before them as equal under all the aspects in which under my province I have been called upon to view them. Their familiarity with the resources and interests of the country bordering on the lines, will enable them to estimate and compare the amount of trade on each; a preponderance of which, may very justly form the basis of a preference. I would beg leave, however, to add, that looking to a connection with the works which are contemplated between the western parts of the state, and the sea-board, and to the lateral branches which are authorized by the charter, the western route is decidedly to be preferred. But whether the eastern or the western route be selected, I can confidently assure the board, that no portion of the United States, certainly for the great extent of country embraced, offers so many facilities for the construction of a rail road. Timber of the best quality is found on every part of the line; the soil consisting either wholly of sand, or a proper admixture of sand and clay, affords as good a foundation as can be expected from earth alone. Granite occurs on the Tar River, and on Fishing and Quauky Creeks; and will be used in forming the abutments of the bridges across these streams; and for the construction of drains within convenient hauling distance. Where rock is not convenient, wooden structures will be used in the passage of the water courses and ravines, to be substituted hereafter by stone or brick, which can be delivered much more economically after the completion of the road. The entire elevation of the road above tide water, is 189 feet. This is overcome by grades rarely so great as 30 feet to the mile. The whole length of curvatures on the road does not exceed thirteen miles; and in every instance, the departure from a straight line is effected on curves described with a radius exceeding a mile. So slight indeed are the grades and curvatures compared with many other roads in the country, that yours may be considered as straight and level; certainly as presenting every facility for the most extensive and economical application of swift locomotive power, to which rail roads owe their undenial superiority wherever, as will be the case here, gravity has but a small share in the resistance.

The estimate of the roadway formation, falls far beneath the average cost of similar works; while it is believed that the profits will not be excelled by any improvement in the country. For your rail road, in connexion with the Portsmouth and Roanoke, and the Petersburg Rail Road at Weldon; both of which are links in continuous lines of railway and steamboat communication to Boston, must become the great thoroughfare between the north and south; for between the Roanoke River and Charleston, or the Charleston and Hamburg Rail Road, admitting there were any other communication by railway contemplated, its greater length, and what is a matter of deeper consideration, its greater expense, forbids the idea of rivalry; and places your road almost beyond the reach of competition. So that we may say, in fact, it forms an important, if not indeed, the most important link in the great line of intercommunication between the north and the south. Under this view of the subject, it is difficult, without the appearance of exaggeration, to estimate the probable revenue.

The travel between Charleston and the northern cities by steamboats and stages, may be safely computed at sixty thousand. This amount might be greatly swelled by embracing the whole travel from New Orleans; which we confidently believe will take the route of your rail road.

But we will say sixty thousand travellers at $12 50 each,	$750,000 00
To this we may add for the transportation of the mail,	50,000 00
Way passengers and freight on produce and goods,	100,000 00
	$900,000 00
Deduct for the repairs and renewal of the road and steamboats	$200,000 00
And it leaves a nett revenue of	$700,000 00

Now, although I believe this sum will fall short of the receipts for the first year, yet, lest we should appear too sanguine, and to remove all possible objection, we will deduct from the foregoing, twenty-five per cent. which reduces the amount to $525,000 00, or a dividend of thirty-five per cent. on the estimated cost of the work.

A rail road which produces six per cent. nett in the first year of its operation, is considered good property; for the increase of business which must ensue, always increases the annual profits in a great ratio.

While our estimates exceed this per centage nearly six times, it will be perceived that we have confined ourselves entirely to the amount of the present travel; and this after being taken at a very low estimate, reduced twenty-five per cent. But in presenting a view of the prospects of the road, we should anticipate the probable increase of travelling by reason of the increase of the business and population of Charleston; which must ensue from the great and gigantic scheme which she has in contemplation, and which she will no doubt carry into effect to Cincinnati. And in a few years the rail road to Hamburg, which is now being extended to Athens, will be prolonged southwardly to Columbus; and thence in continuation with the rail road to Pensacola, complete the line of railway and steamboats all the way to New Orleans. But without any further specification of the various improvements which are in contemplation and begun at the south, suffice it to say, that your southern termination at Charleston, towards which all these improvements converge, ensures you immediate, continually increasing and never failing sources of revenue; and completely sets all competition by other and similar improvements, at defiance. For all past experience has shown that the travel on routes connecting commercial cities, increases in a ratio, much beyond that of the business or population; and the great lines of travel in all countries lead through the commercial towns.

Routes passing through the interior, with a view to divert travel, must be regarded as experiments, running counter to all experience, and of very doubtful success. And I lay it down as an incontrovertible fact, that those works which will prove most profitable, and most conducive to the great and varied interests of the country, may be classified under two heads. Those which connect the commercial cities, and those which lead from the commercial towns by the most direct routes to the interior and western portions of our country.

But your revenue will be greatly swelled from other sources, which we have not taken into the account. All the improvements which are contemplated from the sea-board to the western part of your state, must cross the line of your railway; and to whatever point destined, will find it to their interest, to some extent, to pursue it, in order to make selection of the most favorable location. Under this aspect, your rail road presents itself to the state in a peculiarly interesting point of view. It traverses it nearly through its entire length from north to south, and forms the basis upon which the internal improvement scheme of the Raleigh Convention may be most economically carried out. For, as I have before intimated, the cheapest route from any point on the sea-board to the west, from Beaufort, for instance, to the narrows of the Yadkin, will be found on a very direct line west, until it falls into your rail road; and thence (in this case) along it to some point south of the Neuse River.

In a military point of view your rail road, in connexion with the Portsmouth and Roanoke Rail Road, and the contemplated rail road between Wilmington and Charleston, may be regarded as forming a complete line of defence to the whole sea-board from Norfolk to Charleston; for there is no rail road in the country, upon which so large a force can be concentrated in a given time; and where, perhaps, there would be a greater probability of its being required. By the Charleston and Hamburg Rail Road and its connexions; the Charleston and Cincinnati Rail Road; the Roanoke, Danville, and Junction Rail Road; the Portsmouth and Petersburg Rail Roads; and by means of the railways to the west within your own state, levies for troops on South Carolina, Georgia, Alabama, Louisiana, Mississippi, Tennessee, Kentucky, Illinois, Indianna, Ohio, Virginia, North Carolina, Maryland, &c., may be met from the remote states in a few days, and in a few hours, from the more adjacent states, and any number of troops, may be thrown on the line of your railway; whence, by lateral roads and steam boats, (down the numerous navigable streams which the road crosses) in a few hours, or by a march of a day or two, they may occupy any position on this extended coast. And in the transportation of stores and munitions of war, which, under the military head, is a matter of primary importance, it affords a safe avenue; and in time of war, will prove a saving of millions to the government.*

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* *Extract from the Report of Mr. Cass, Secretary of War, on National defence.*

"The power of transporting troops and munitions of war, has already opened new views upon this subject; and such is the progress and probable extent of the new system of intercommunication, that the time will soon come, when almost any amount of physical force

As a national work, therefore, yours cannot be considered as secondary to none in the country. But one of the most happy results of the railway system in the southern country, and which will be imparted by your rail road, to that portion of the state most concerned, is the effect it will have, by the speedy concentration of troops to put down, if not entirely suppress and remove all apprehensions of servile disturbances and insurrections. The speedy transit of the mail, especially between commercial cities, is an object of solicitude with all governments. Your improvement fully meets this object, and its importance under this head also, cannot fail to attract the attention of the general government; and also the concentrated concurrent interests of the large cities at the north. And having the effect, as we have asserted, your road will have, to turn the whole stream of travel between the north and the south, through Charleston, and on the Charleston and Hamburg, and the Charleston and Cincinnati Rail Roads, she, as well as those interested in these two great improvements, are deeply interested in your success, and will no doubt contribute largely towards it; and the trade and travel which it will throw on the Portsmouth and Petersburg railways, will greatly enhance their profits, and advance the prosperity and wealth of Petersburg, Norfolk, and Portsmouth.

The counties along the line have manifested the interest with which they regard it, by the handsome subscriptions which they have made.

The benefits to Wilmington will be immediately felt in the great increase in the exchange of commodities, which the increased facilities of communicating with a rich back country will afford. And she may be justly proud of the rank to which she will elevate herself, in having projected and carried into effect, an improvement which may be characterized as a great national and state work.

All, which is respecfully submitted by,
Gentlemen,
Your obedient servant,
WALTER GWYNN,
Civil Engineer.
Wilmington, Aug. 15, 1836.

BEET ROOT SUGAR.

A remarkable proof of the facility with which beet-root sugar manufactories may be established, is presented at this moment at Wallers in the department du Nord.—Four of the villages, by advancing 50 fr. each, have formed a joint capital of 200 fr., and with this they produce between 40 and 50 lbs. of sugar, of rather inferior quality, a day. They employ currycombs to rasp the beet roots, which they put into a napkin press to extract the juice, and then boil the syrup in common culinary boilers.

We learn from Berlin that the manufacture of sugar from beet-root has become quite a mania in Prussia, and that the land-owners have given up the cultivation of potatoes for distillation, and planted all their fields with the new saccharine root.—[*English paper.*

From the Genesee Farmer.

THE PERSIMMON.

(*Diospyros virginiana.*)

The Persimmon tree perfectly matures its fruit in the Genesee Country, though we have not seen it growing indigenously further north than the banks of the Susquehanna near Catawissy. It is entirely hardy. The fruit is pleasant, "in form and bigness like a date, very firm like that fruit and almost as sweet," and we think it well worthy of the attention of those who have a taste for varieties.

This tree belongs to Polygamia Diœcia of the Linnæan system—the male flower growing on separate plants, while those which produce the fruit have hermaphrodite flrowers. Botanists have considered that the anthers of the latter were effete and useless. On examining both kinds of flowers however, we discover nothing to warrant the conclusion; and we were strengthened in our doubt by the circumstance of a large grove of these trees, all originating from one root, that were productive; while no male or barren tree was known to exist in the neighborhood. The case seemed to be nearly analogous to what often occurs in our wild grape, and in the strawberry; and we therefore made the following experiment: One persimmon tree had not failed to bear fruit for several years. At the distance of twenty feet from it on the west side, stood a tree which produced only staminate flowers, and another at twice the distance on the east side. In the year 1832, we cut down both the male trees just as the fertile flowers were beginning to open, and immediately removed them so that none of the pollen could reach those flowers. The consequence was, —*not a single persimmon was produced in four years.* Vigorous suckers from the stumps of those trees however sprung up; and this spring we observed that one of them had a few flowers: *The fertile tree is now once more set with fruit.*

From this experiment, which we made at our cost, both nurserymen and customers may learn the futility of planting out a single tree, far remote from all others, with the hope of its bearing fruit. We have seen a tree that was set out when no other was known to be within hundreds of miles. Neither the nurseryman nor the purchaser, knew to which *sex* it belonged, and it is doubtful if the proprietor knows at this day, for it has always been barren. Our advice to such as wish to cultivate the persimmon, is therefore to buy trees *in pairs*, and to buy them of those who are worthy of their confidence.

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may be thrown, in a few hours, upon any point threatened by an army. Nashville may succor New Orleans in sixty hours; Cincinnati may aid Charleston in about the same time; Pittsburgh will require but twenty-four hours to relieve Baltimore; and troops from that city, and from Boston, may leave each place in the morning, and meet in New York in the evening. This wonderful capacity for movement, increases in effect, some of the most important elements of national power. It neutralises one of the great advantages of an assailing force, choosing its point of attack, and possessing the necessary means of reaching it. Detachments liable, under former circumstances, to be cut off in detail, may now be concentrated without delay, and most of the garrisons upon the sea-board may be brought together, and after accomplishing the object of their concentration, be returned to their stations in time to repel any attack meditated against them."

THE LAW IN REGARD TO DIVIDING FENCES.

Judge Strong, in a recent case in our Common Pleas, has decided that no one has a right, when making a division fence, to run half of the same on the lot of the neighboring owner—but that it must be wholly on the land of him who makes it. The case which called forth this decision, was an action of trespass for cutting a ditch in a meadow land, for the purpose of a fence. It appears that the defendant in this case, cut some five feet wide on each side of the line, which constituted the boundary between him and the plaintiff; and the Judge in his charge enforced upon the jury, that by no existing statute was the making of a fence on the lot of an adjoining owner justified; but that those constructed half on one side and half on the other, must be constructed by mutual consent; otherwise legal measures could be instituted for damage, &c. The owners of real estate should recollect this decision, as cases in which it would be applicable, are not unfrequent in our courts of justice.—*Northampton Courier.*

From the Key West Enquirer.

FLORIDA ARROW ROOT.

The day, we trust, is not far distant when prejudices in favor of the productions of foreign countries will case to operate to the detriment of the agriculturists and manufacturers of our own. We are sufficiently friendly to the policy and principle of free trade, to allow every man to exercise the most perfect freedom in the purchase of whatever he may require, whether the necessaries or luxuries of life, at whatever price he may think proper, yet we cannot but lament the blindness or perverseness that lead any one to overlook an article of home manufacture supplied at comparatively a low price, for one of foreign production in no way superior and truly considered "a dear article." The arrow root which is the growth of South Florida, may be considered one of the home productions which are sacrificed to the undue preference for those imported. Equally white, equally pure with that of Jamaca, heretofore deemed the best, and by many thought to be the most nutritious of the two, there can be no reason for its not superseding the necessity of supplying market with any of the articles from abroad.

We have no price current at hand giving the value of the imported article in first hands, but we are well assured that it cannot be imported at less than from two or three times the price of that manufactured in this vicinity, which is from 6 to 8 cts. per lb. With an increase of demand, the aid of machinery would be required, and diminution in price might be anticipated; at present a similar mode of manufacture to that followed abroad is pursued in Florida, though it is probable the Florida manufacturers possess not all the facilities of their competitors.

We are not sufficiently versed in botany to pronounce upon the similarity of the Florida root to that of Jamaica or Bermuda, but there can be no doubt of their belonging to the same family of plants. The quantity manufactured is sufficient for the present demand, and doubtless will increase, as the root is indigenous, and but two or three planters being at present engaged in the manufacture, and that too, in connection with their other agricultural pursuits.

The low price at which the Florida arrow root is sold, allows of its being applied to other purposes than those to which, from its dearness, foreign arrow root was usually restricted. For instance, it is used here almost universally, in the place of starch, and no one can visit Key West without being positively satisfied of the fitness of the substitute. It is so extremely valuable in the composition of many nicities of the table (a fact which we have made known for the particular edification of our fair readers,) and particularly in an imitation *Best Mung.* It is used by the planters in some places as a bread stuff, and was so used by the aborigines, but do not ask it for so general a use as to have it supersede the use of either wheat or rye.

We shall rest satisfied if our notice secures for the manufacturers as great a demand as the goodness of their arrow root deserves.

From the Genesee Farmer.

THE CHINESE MULBERRY.

(*Morus multicaulis.*)

Last year our Chinese Mulberry produced fruit, and we have three plants growing from the seed. One is eighteen inches high, and all are in thriving condition. The leaves are as large as those which grow on layers or cuttings of the same size; and prove very satisfactorily to us, that the tale of such seeds producing the common white mulberry is all a fiction. The explanation doubtless is, that the true seeds were not obtained.

Whether these seedlings will be hardier than trees from cuttings, or not, we do not know; but hope they will be so; and on this account we shall value them higher than trees from cuttings of the old kind. Unfortunately, our tree was so much injured last winter, that no fruit was obtained from it this season.

From the Albany Argus.

THE GEOLOGICAL SURVEY OF THE STATE OF NEW YORK.

It will be generally recollected that the legislature at the last season, made provision for a geological survey of this state, including an account of its botanical and zoological productions. This important measure was to be executed under the direction of the governor, by competent persons to be appointed by him. The outlines of a plan for this work, together with a specification of the objects to be embraced in it, were submitted to the legislature in an able and excellent report, made to that body by Gen. Dix, as secretary of state. This plan has, with some inconsiderable alterations, been adopted by the governor. The state is divided into four districts, and one principal geologist and an assistant assigned to each, instead of two geologists, as suggested in the report made by Gen. Dix.

It was supposed that it would be necessary to have a draughtsman for each district, but it is believed that a change in this respect can be advantageously made. The geologist and his assistant will be able to execute all the ordinary drawings, and the services of only one draughtsman will be required to execute the more difficult parts of this branch of the work. An accurate, minute and uniform analysis of the minerals, including mineral waters, and of the various soils of the state, has been deemed of great importance, and will be of evident utility. To ensure the best result in this respect, and to prevent the repetition of the same labor to some extent, at least, by each geologist, this department of the work has been committed to one person. The governor has, we believe, taken great pains to secure to the state the services of persons in all respects well qualified for the duties assigned them ; and has almost completed the list of appointments.

John Torrey, M. D., Professor of Chemistry and Botany in the College of Physicians and Surgeons, New York, &c., is appointed Botanist, and is to execute the botanical department of the survey.

Lewis C. Beck, Professor of Chemistry and Botany in the New York University, &c., is appointed Mineralogist and Chemist, and has charge of that branch of the work which relates to the chemical analysis of the minerals, soils, &c.

James E. De Kay, M. D. author of numerous papers on the Geology and Zoology of the United States, has charge of the Zoological Department.

William W. Mather, for several years Professor of Mineralogy and Geology in the Military Academy at West Point, is appointed Principal Geologist to execute the survey of the first district. His assistant has not yet been selected. The first district is composed of the following counties—Suffolk, Queens, Kings, Richmond, New York, Westchester, Rockland, Putnam, Dutchess, Orange, Sullivan, Delaware, Ulster, Greene, Columbia, Rensselaer, Albany, Schoharie, Schenectady, Saratoga and Washington.

Ebenezer Emmons, M. D., Professor of Natural History in Williams College, has been appointed Principal Geologist for the second district. James Hall, instructor in the Rensselaer School at Troy, is appointed the assistant. This district contains the counties of Warren, Essex, Clinton, Franklin, Hamilton, St. Lawrence and Jefferson.

Timothy A. Conrad, author of a work on the "fossil shells of the tertiary formations of the United States;" Monograph of the American Uniodeæ, &c. is appointed Principal Geologist for the third district; and Geo. W. Boyd, M. D., curator of the N. Y. Lyceum of Natural History, is appointed his assistant. This district includes the counties of Montgomery, Herkimer, Oneida, Lewis, Oswego, Madison, Onondaga, Cayuga, Wayne, Ontario, Monroe, Orleans, Genesee and Livingston.

The fourth district includes the counties of Otsego, Chenango, Broome, Tioga, Cortland, Tompkins, Seneca, Yates, Steuben, Allegany, Cattaraugus, Chautauque, Erie, and Niagara. Lardner Vanuxem, late Professor of Chemistry and Mineralogy in Columbia College, South Carolina, has been appointed Principal Geologist for this district. The assistant has not yet been selected.

TRADE IN BIRDS' EGGS.

The Portland Courier tells us that the schooner Martha Jane, of Fall River, arrived there on Wednesday, from the coast of Labrador, with two thousand dozen of Sea Gulls' eggs. They sold readily at twenty-five cents a dozen. A portion of the cargo were to be carried to Boston. They are the grey gull's egg; nearly twice as large as the common hen's egg, some of them blue, and some white with black spots. It is said these eggs are found in such large quantities, that many vessels make a profitable business in carrying them to market.

The Portland Advertiser says, that they are the eggs of a species of bird called the Murrh, that has, from time immemorial, monopolized the business of egg making on the Labrador coast. The eggs are the size of a large turkey or goose egg, in the shape of a bell pear, and of all the colors that can be found among the latest patterns of calicoes. They are stowed in the hold of the vessel like common stone ballast, and are selling off rapidly.

Extracts from the Journal of the Franklin Institute.

LIST OF PATENTS ISSUED IN JANUARY, 1836, FOR IMPROVEMENTS OF MACHINES, &C. TO BE USED IN AGRICULTURE, OR DOMESTIC ECONOMY.

With remarks, by the Editor of the Journal of the Franklin Institute.

For an *Elastic revolving belt Saw;* Benjamin Barker, Ellsworth, Hancock county, Maine, January 6.

The patentee says, "what I claim as my invention, and not previously known in the above described machine is, the elastic revolving belt saw, and the manner of using the same. I do not therefore, claim as my invention any of the other several parts of said machine, nor their particular combination." If the patentee could have made any new arrangement of the parts for operating this saw, he might have claimed such arrangement with some propriety, but the saw itself which he does claim is quite an old affair ; it is mentioned in Rees' Cyclopædia ; has previously been patented more than once in the United States ; has been repeatedly tried, and as frequently abandoned as worthless in operation ; and such will again be its fate, should it again be essayed by the present patentee.

For a *Forest, or Tree Saw;* Walter Hunt, City of New York, January 6.

Considerable ingenuity has been displayed in the arrangement of the apparatus described and figured by the patentee, who has made his invention fully known. The apparatus consists of a *grapple* by which the whole is to be attached to the tree to be felled, by means of a screw, spike, &c.; the *lever*, to which one end of the saw is to be attached, and which, by being moved backward and forward horizontally, operates on the saw ; the *saw* and a *spiral spring* by which the latter is to be kept up to its cutting bearing. The particular construction of these parts we shall not attempt to describe. The patentee claims "the style of construction, combination, and arrangement of the *forest tree saw*, as above specified, &c." We shall not, as we have said, attempt a particular description of the proposed arrangement of the parts of this machine, but predict that it will share the fate of other saw machines for felling trees, and be found by far less efficient than the axe of the woodman. We apprehend that the patentee has not had much experience in clearing land, or he would have known that his wedges and other contrivances would not enable him to determine the direction in which his tree should fall, and that the experienced axeman is sometimes at a fault in this particular, an event which would be fatal to the whole apparatus before us.

For *Separating foreign seeds from Clover Seed*; James Manning, Lambertsville, Hunterdon county, New Jersey, January 6.

A screen, or riddle, is to be made in the form of a flour bolt, or otherwise, and this is to be covered with wove wire, the meshes of which are oblong, and a little narrower than the diameter of the clover seed; the claim is to the "making these apertures of an oblong figure." This patent will take rank with those which are the least worthy of an exclusive right, for however good such a screen, sieve, or riddle, may be, it has been so common as to render the idea of claiming it as a novelty truly ridiculous.

For a *Washing Machine;* Joab H. Hubbard, Bloomfield, Harford county, Connecticut, January 6.

By this machine the clothes are to be "pounded" in a box, upon the bottom of which there are pins projecting upwards; the pounders, two in number, having pins on their lower sides which pass into the spaces between those within the box. The pounders have each a rod extending up from them through the lid of the box, and these being operated upon by cams and springs, are raised by the former and forced down by the latter. A horizontal shaft carrying a cog wheel, and turned by a winch, causes a second shaft, having a pinion on it, to revolve, this latter, carrying the cams, or lifters: rather a complicated child of ingenuity this, and one, which we opine, will not find many foster mothers.

For a *Mill for cutting Grain and other articles;* William Gerrish, Portsmouth, New Hampshire, January 11.

Two iron plates from six to eighteen inches in diameter, constitute the cutting, or grinding, part of this mill. The under plate is to be the runner, and to be driven by any proper gearing; both plates are to be slightly conical. The upper plate is to have several perforations in it, which are to receive cutting irons, fixed and operating in the manner of plane irons. Besides these cutters there are ridges, or teeth upon the grinding faces. The claim is to "the cutters and cavities, their particular arrangements and principle, applied to this purpose."

For a *Machine for Planting Corn;* Charles R. Belt, Washington county, District of Columbia, January 15.

There are many patented machines for planting corn, cotton, and other seeds, so nearly resembling each other, as to constitute different modifications only of the same machine, and such is the character of the one before us. The claims made are confined to two particular points in which the patentee considers his machine as excelling its predecessors, but its superiority not being apparent to us, we shall pass on to other matters.

For a *Plough;* John Dolhaner, Canton, Stark county, Ohio, January 15.

There is nothing claimed as new in this plough, but the mode in which the parts are fastened together, so as to give it the desired stability.

For *securing Wells from the influx of Surface Water;* Levi Kidder, city of New York, January 15.

"The principle of this improvement consists in the construction of hydraulic cement, of a protecting cover and sides to wells, cisterns, reservoirs, and other vessels in the earth, whereby the water within them will be secured against the influx of surface water, and the intrusion of vermin in the mode and by the means substantially as described."

The mode described is to raise a wall of cement upon the ordinary wall of the well, to cover this with a top in the form of a dome, leaving an opening in the middle for the pump body.

For a *Machine for pressing Tobacco in;* J. Beverly Allen, City of Richmond, Virginia, January 15.

This machine for pressing tobacco in, is merely a square box, four of the sides of which are of tin, the other two being of wood. The patentee says that "before this box was invented, the manufacturers of pressed tobacco were compelled to use oaken boxes, the material for constructing which has recently become very costly, and difficult to be obtained. What I claim as my invention, and not previously known, in the above described machine, is the use of tin for four sides thereof, instead of wood, which was before exclusively used."

For a *Plough;* Samuel Witheron, Gettysburg, Adams county, Pennsylvania, January 15.

The whole description is as follows: "The improvement consists in placing a roller under the beam, near the centre of the plough, in or near a perpendicular position; the roller may be made plain, ridged, grooved, or otherwise. The use of the roller is to prevent the plough from choaking, by rolling off the vegetable matter that usually collects under the beam."

For an *Art, or method, or process, of lessening the consumption, and of increasing and otherwise improving the effects of fuel;* Isaac Orr, Washington, District of Columbia, January 20.

It is not easy from the title, to tell for what this patent has been obtained; whether for a stove of a particular construction, or for the art of managing the fuel. The claims however, fifteen in number, relate principally to matters of construction, but in a way so general and diffusive, as not by any means to enable us to distinguish those things which are intended to be the subject of the patent "from all other things before known or used," as required by the act of Congress. The principal feature in the stove which the patentee denominates the *air-tight stove*, is the so constructing, or making, the sliding or other doors which open into the stove, that when closed they shall be, as nearly as may be, air-tight, by which means the combustion of the contained fuel, may be completely controlled, and but little, or no consumption take place, whatever may be the quantity within the stove. That such a stove cannot, and must not, be made perfectly air-tight, will be at once admitted, and we are not aware at what degree of good fitting, the affair would be entitled to a patent. We have a stove in which the design was to make the doors, and the ash drawer, fit as closely as possible, so that the fire might be regulated by the drawing out, or closing, of the latter; this is one of Spoor's, and there are many others similarly constructed in this respect, and in which, were the workmanship made a little more perfect, without any change of structure, all that Mr. Orr proposes from this arrangement would be accomplished.

In addition to the close doors, the patentee has grate bars placed under the fuel, resembling the revolving vertical dampers, or valves, used in some stoves, and consisting of two plates with openings, which may be made to coincide, or which may be closed by the unperforated parts. If we do not greatly err, such a grate will be obstructed by the coal, and choaked by the ashes. There may be enough in some of the individual arrangements pointed out, upon which to found and sustain a claim, but they are not made to stand alone, and it is not in our power to put them in a situation to do so.

For a *Portable Reflecting Baker;* Lorenzo B. Olmstead, Binghamton, Broom county, New York, January 20.

This tin baker is to be heated by means of a cylinder of sheet-iron, which is to contain ignited charcoal, and to pass vertically down through the back of the box which constitutes the baker. This latter is a kind of eight sided oven, the top being ridged like a roof, and the bottom in the same form inverted, the back circular, and the front, which lifts off, being straight; we mention these things because the peculiar form is claimed. The articles to be baked are put into pans, which stand on wires within the baker, and the fire being kindled, and the front reflector affixed in its place, we are assured that the desired operation will be "performed sooner than in any known oven or baker, with an immense saving of fuel."

For a *Thrashing Machine;* Eleazer Brown, Chenango, Broom county, New York, January 20.

This thrashing machine consists of a hollow cylinder about three feet in diameter; its length is not mentioned, but from the drawing, we should suppose it to be, at least, twelve feet. It stands horizontally in a frame, and within it revolves a shaft, which carries four, or any other number of rows of wooden beaters. The grain is fed into the cylinder through an opening in its side, near to one end, which is closed, the other being left open. On the shaft near the closed end are spiral fan leaves, which force a current of air through the cylinder. The patentee says that "the rapid motion of the shaft separates the grain, and the strong current of air driven through the cylinder by the fans, carries out the straw and grain." There is no claim made, the general construction being probably considered as new, which we believe it is.

For a *Horse-Power;* Samuel Newton, Dayton, Montgomery county, Ohio, January 20.

This horse power is one of that kind which receives its impulse from the walking of the horse, or other animal, upon an inclined floor forming a chain of slats, the patentee calls it the "Friction Obviator, or Double Chain Horse-Power," in which is combined the joint application of two continuous, or endless, chains. The second of these endless chains consists of rollers connected by suitable straps, which sustain the movable floor by running upon a suitable railway under it, the part not so employed hanging down beneath the floor. After a full description of the apparatus a claim is made to "the particular manner of constructing the friction chain," &c. We could refer to several patents taken in the United States, for a perfectly similar contrivance; but will go farther back than any of these, and look in the second volume of the first series of the Repertory of Arts, p. 366, where we find the same machine described and figured, having been patented in England, in January, 1795.

For a *Plough;* John P. Chandler and Peter Ranger, Wilton, Kennebeck, Maine, January 20.

We have, for brevity's sake, called this a plough, but the patentees denominate it a "Machine for ploughing land," and indeed from its complexity it appears to require some such appellation. It has an axletree and two wheels, like a cart, with a frame somewhat like that of a cart body, sustaining a tongue to which to attach the horses, together with other appendages. Under this frame there are to be three ploughs abreast, all of which are to be managed, by means of levers and suspending chains, by a person seated on the machine; the ploughs being so suspended that they can be raised or lowered at pleasure. The claim made is to "the using of two or more ploughs at the same time, and with the same team; and also having the plough suspended so as to have the weight of it carried on wheels." The patentees might, probably, sustain a claim to their own mode of doing these things, but double ploughs have often been used, and wheeled ploughs are represented in the books, and are common in Europe.

For a *Corn Sheller;* Warren Carpenter, New Castle, Mercer county, Pennsylvania, January 23.

A plank is to be slid up and down between two cheeks, grooved for that purpose; into each side of this plank iron pins are driven, which project out a short distance. The corn to be shelled is to be dropped in between this slide, and two pieces of plank near the lower end of the frame, which are borne up towards the slides by springs; these spring pieces of plank are armed with teeth, like the slide. The slide is to be worked up and down by hand. The claim made is to "the particular structure, combination and arrangement of the respective parts."

For a *Machine for Packing Flour in Barrels;* Jonathan F. Barrett, Granville, Washington county, New York, January 23.

This is certainly a new, and, we think, a good machine. The flour to be pressed, runs into the barrel in a continuous stream, and the pressing commences at the bottom, and goes on until the barrel is filled. The barrel is placed on the bed of the press, and above it there is a vertical shaft, which is made to revolve by a drum and band, and is capable of rising and falling through the height of the barrel. At the lower end of this shaft there is what is called a screw, but this essential part is very imperfectly described; it is nearly of the diameter of the interior of the barrel, and appears to be a transverse section, containing a single thread of a screw, and it has, of course, an opening from its upper to its lower side, through which flour may pass. The shaft, we suppose, must revolve in a direction tending to raise this section of a screw, and the bottom of it, forming a spiral inclined plane, presses upon the flour as it passes through the opening, having to operate upon thin successive strata only, and thus gradually rising to the top, when the packing is completed. The shaft is loaded with any amount of weight which may be found necessary, and there is appended to it the apparatus necessary for raising and lowering the shaft rapidly, when requisite. The claim made is to the employment of "a screw on the end of a weighted shaft," in the manner described.

The patentee says that about three minutes completes the pressing of a barrel of flour; the manual labor, however, not exceeding five seconds; that during the operation there is not any bursting of hoops, or pressing of flour out of the sides; that with a machine made to test the improvement, one man can readily pack, weigh, and nail off, about twenty barrels per hour.

For an improvement in the *Garden Hoe;* Adna Allen, Ramapo, Rockland county, New York, January 23.

This patent is taken for the manner of attaching the shank to the plate of the hoe, so as to render it secure from working loose. The plate or blade of the hoe, is perforated with a square hole; the shank is made to fit this hole, and has a collar formed on it which comes up against the plate; a second plate, like a washer, passes over the shank on the face of the hoe, and the whole is secured together by riveting; the shank is secured in the handle by a ferule, and fastened by a key driven through both. The claim is to "the collared shank, back plate, and rivets, viz: the collar on the shank, and the principle of attaching the back plate to the plate of the hoe."

DEBATE ON THE CROW BILL, IN THE SENATE OF VIRGINIA, FEBRUARY 9, 1826.

(*Reported by a silent member.*)

[The subject of the burlesque report which, by request, is here published, is one of the very few on which the Legislature of Virginia have acted, for the purpose of aiding agricultural interests—and on that account, more than for the importance, or the wisdom of the action, it may perhaps deserve to be recorded in the Farmers' Register. As to the *manner* of the report, burlesqued and changed as was the form, to suit both the humor and the metre of the writer, we can testify that the substance of each speech is at least as well preserved as in the ordinary *prose* reports of debates—there having been as little taken away from the oratorical graces in the one case, as is usually furnished by the reporters in the other.]

——Crows and choughs that wing the midway air
Show scarce————
Shakspeare.

Mr. M——y.
By that bill Mr. Speaker, 'tis meant to propose
The form of a law for the killing of crows;
A county requests us—the county Fair-*fax*,
To place it as one in the list of our acts.
I'm sure Sir that you and that every one knows
How *very* destructive to corn are the crows;
There is not, perhaps, any bird, Sir, that hops,
That pulls up as much of the cornplanter's crops;
They gather by thousands, and tear with their bills
Each plant as it peeps through the top of the hills;
I see, Sir, this subject produces some mirth,
But let not a crow, Sir, remain upon earth.
If the West is to pay for the wolf and its whelps,
Why may not the East for the crow or its scalps?
I hope then, the Senate will pass, Sir, the law,
We wish not in Fairfax to hear a crow *caw*.

Mr. R——n.
Mr. Speaker, I move to amend the crow bill
By adding to those who have license to kill:
Insert after "Fairfax" the words "Isle of Wight;"
"Southampton and Surry" you also may write.
'Tis not that *I* have—oh no, heaven knows,
A thirst, Mr. Speaker, for blood of the crows,—
Prince George and the crows are on very good terms;
We want them to eat up that pest, the cutworms.
But *some* of my counties complain with Fairfax,
And is'nt it right they should come in for snacks?—

Mr. M——y.
With this bill, Mr. Speaker, some wags down below
Are strongly suspected of "*picking a crow.*"
Against that amendment, I therefore shall vote,
We might just as well catch the *bill* by the *throat;*
'Twill excite such a laugh in a certain great hall
They'll scout from the House the amendment and all—
I hope, Sir, the bill will be then let alone,
This amendment will cause it to die with a *groan.*

Mr. P——e.
Mr. Speaker!!!! I hope the amendment and bill
Will find in the Senate no jot of good will.
To hold out a bounty in *any* such case
Is simply rewarding the vagrant and base;
From labor productive 'tis taking away Sir,
Your hundreds to idle and waste all the day Sir;
Instead of promoting the true *wealth of nations*
'Tis taking men off from their suitable stations,
From digging, from grubbing, and other hard blows,
To shooting their guns at a parcel of crows.
But Sir, I assert it—'tis true on my word,
The crow is in fact a carnivorous bird;
He does'nt *like* corn sir—he *would'nt* eat grain,
He'd strut by the thing in a fit of disdain;
If he only could get flesh enough for his turn,
What you think is his passion, he'd caw at and spurn;
'Tis mere "Hobson's choice" with him when his scorn
Is seen to relax, and he gobbles your corn.
I would ask too the member who urges this tax,
If it be not unwise in the county Fair-fax?
If the end is effected, this crow bill enforces,
What *is* to become of *his mass of dead horses?*

Mr. C——l.
It may seem, Mr. Speaker, to some of the counties
To be a small matter, this granting of bounties—
But long have I thought, Sir, 'twould be very wise
In planters, some plan of the kind to devise.
The interests of husbandry, calling now louder,
Must have something stronger than smell of gunpowder.

These birds come upon us like hordes, Sir, of Huns
And take care to keep out of range of our guns;
Some people have tried a contrivance we know
Which all have consented to call a scare-crow;
But I've seen them light on it with great *nonchalence*,
And hopping about as if learning to dance.
A plan *I* once thought of, I'll freely disclose,
'Twas to grant, Sir, *a pension* to each of these crows:
If I gave them as much of my corn as they'd eat,
I thought that to steal it, would not be so sweet;
But alas, Mr. Speaker, they'll just as soon go
To the corn you have planted, as that which you strew.
I own Sir, a farm in the old Northern Neck,
Where crows would outnumber the grains which they
peck,
And unless some provision is made in our laws
I fear Sir, the planter must give up his cause.

Mr. R——n.
Although, Mr. Speaker, I moved that three counties
Should also partake of these ruinous bounties,
I did it alone from a sense of my duty,
And not that *I* saw in the scheme any beauty.
What the gentleman said who was last on the floor,
In the truth of my *dogmas*, but rivets me more;
The plan of a pension we've heard him rehearse,
Has proved, like the *poor laws*, an infinite curse.
His system Sir, failing, conclusively shows
It swells but the number of paupers and crows;
Malthus and others have proved that such laws
Increase but the cramming of *bellies* and *craws*.
I therefore shall vote Sir, against the whole bill,
And I wish that the Senate would help me to kill.

Mr. C. J——n.
That bill, Mr. Speaker, proposes to *tax*
All who reside in that county Fair-fax—
The *grower* of corn and he who grows *none:*
'Tis *wrong* Sir, injustice like this should be done.

Mr. F——y.
A law about wolves, Mr. Speaker, 's been made,
And a tax on the county requesting it, laid.
The man who *grows* wool and the man who does *not*
Are surely involved in a similar lot.
The principle here is the same, Sir, I trow;
If you tax for the wolf, you may tax for the crow.

Mr. S——p.
A *single* remark, Mr. Speaker,—the man
Who does'nt make corn, eats bread if he can.
The more that is made, the cheaper he buys,
Then does'nt he profit when any crow dies?

The Speaker arose from his arm chair at last
And ask'd if the bill in his hand should be passed,
And the "ayes" seem'd to have it, he said by the sound,
And the foes of the crows, how they crowed on the
ground!!

FEB. 10.
We hasten to notice an error we fell in
Reporting this bill, as regards Mr. A——n.
That gentleman moved an amendment, to wit,—
"If laws on the subject were thought at all fit,
Those laws should be gen'ral, and each county court
In its wisdom, to scalping of crows might resort;
He thought that a body so grave as the Senate
Should not have a thing like a crow-bill within it;
If the bill should go through with its one-sided features,
Then year after year we should hear of these creatures;
'Twas best in his judgment to deal such a blow,
As would shut up forever the bill of the crow;"
And this was the speech which gave Mr. R——n
What Fairfax would call a fit of "*humgruffin*."
"He had no objection he said to the bill—
As regards other counties,—enact what you will;
But as for *his* county, he warmly protested,
By bell, book and candles, if crows were molested,
The worms there would fearlessly riot and revel—
All chance of a crop would be sent to the devil."

ACCOUNT OF A SHEEP ON TWO LEGS.

To the Editor of the Farmers' Register.

Crawford County, Pa. July 18, 1836.

As any thing of interest connected with domestic animals would be gratifying to you to know, allow me to give you an account, in few words, of a *lamb* which walked on two legs.

Being on a visit to a friend of mine some short time since, my attention was directed to a lamb, which from having been brought forth unexpectedly to the owner, in a very inclement season early in the spring, lost both of its hind legs very near the body. The poor animal was suffered to live—and when I saw it, it could travel (upon its two fore legs) as nimbly as any of the flock, and that without raising the hind quarters, so that the centre of gravity should fall upon the fore feet. I consider the circumstance of a nature most extraordinary, and well worthy to be recorded. The animal must be endued with extraordinary muscular power: its hind parts while it is walking, standing, or eating, maintain very nearly their natural position—a little higher if any thing. It sometimes gets on its knees and eats, without however, touching any other part of its body to the ground. While I was observing it, it leaped over a stick without any difficulty, and lit on its feet. The animal is in good condition, and likely to live as long as any of the flock.

JOS. C. G. KENNEDY.

DEATH OF THE SECOND MULE'S COLT. LAND, AND OYSTER SHELL BANKS OF NANSEMOND.

To the Editor of the Farmers' Register.

Spring Hill, Nansemond Co., Aug. 26, 1836.

Dear Sir:—Permit me to record, in your Register, the death of my second colt, the issue of a mare mule, by a horse. The colt was born in August, 1835, and died on this day, having been sick two or three days. Having lost one, I was desirous of raising this. It was in fine order—the mother doing nothing, upon a good pasture. It is true, the mother nor the colt had not been housed until the night before it was taken sick. I had another colt running in the same pasture, treated in the same way, and is as yet doing well. Every thing was done for the mule's colt that could be done, but it suffered much and died at last. A passage could never be gotten through it, and when dead, I had it opened, and all that could be discovered, was, that every thing that had been given it was then in its stomach, and had never passed on to the bowels. It was blistered on its forehead—the blister drew well, but in vain: and a question arises with me—can an offspring delivered of the body of a mongrel breed, be raised? That question I should like to hear solved by those better informed upon that subject than I am. If it should be thought to be possible to raise one, I will then try the mare mule with a jack, as suggested by A. B. C. (in No. 4,) whose opinion I should like to have upon this subject.

Could you not favor us with a visit some time this fall? I should like for you to do so, and to examine our mineral resources for improving our lands, all within the reach of the present generation—and then stand, yourself, in wonder and amazement, that we should possess so much vacant land, and so little improvement. But alas! the wild western fever is up, and we leave lands here behind us, as good and as cheap, to go into a wild speculation. I should like for you, or some person who is a competent judge, to examine the lands of our Dismal Swamp. A new discovery has been made by some enterprising gentleman, who is now making an effort to cultivate a small portion of it. There is supposed to be a stratum of marl, or calcareous earth, from two to five or more feet below the top of the earth, and I am told that such land (though covered with water in the winter) is bare of timber, save very small growth. That the swamp possesses some as fine soil as ever was, there can be no doubt; and that a portion of our country now almost deserted, and where lands is cheap, is as good as ever was, there can be no doubt. It only wants improvement. As a proof beyond contradiction, I would refer all who doubt, to the farm now owned in Nansemond by Gen. John C. Crump, who came there last January, (it is true, with a good force.) Land that never produced any thing before, now has as fine corn as the western country can produce; and you would ask how did he do it? The only answer is, that he carted out thousands of loads of calcareous earth, from what are called the shell banks, and *that* has produced it: while the very spot that he removed this earth from, produces better corn than previous thereto; and of this earth, he has more than can be removed in ages. Not only Gen. Crump, but hundreds of others can do this, if they would avail themselves of the advantages offered. All we want, are some enterprising people to begin and go ahead—being first sure they are right. My wheat crop, this year, has failed, owing to the rains in May: my corn and oats good; but corn generally injured by the wet. I hope though, we shall make average crops.

I am pleased to find that you are, at last, giving into the opinion that silk would be a profitable cultivation for eastern Virginia. If you will examine all the country, you will find that the mulberry tree is easily and quick raised; and all we want is, management to give employment to our aged and infirm negroes and little children, that generally include about two thirds of the black family.

JOHN T. KILBY.

For the Farmers' Register.

THE RESPECTABILITY OF LABOR—WHO MOST ASHAMED OF IT.

Wardsfork, Charlotte County.

Labor is of high origin, and of ancient respectability. It is only held in low estimation by the low-bred and ignorant part of the community. A young upstart applied to me a few years ago for an overseer's place: By way of applying a touchstone to his tenets, I told him I should expect him to work with his own hands: his sensibilities seemed to be a little touched—and he asked me if I expected him to work "like a *nigger?*" "No indeed sir," said I, "by no means—I would have you work like a *white man:* a negro, sir, requires an overseer, but you will not." He seemed to be a little perplexed at the unexpected turn I took upon him, and appeared ashamed that he had put the question; but his prejudices against labor, I think, were not removed. Labor has been honored by the example of the greatest and best men of ancient and modern times. Among the Romans, says a respectable historian, "the first magistrates, and the generals of the armies, cultivated their fields, and thrashed their grain with those hands which had vanquished the enemy and supported the state; and the Roman people blushed not to give the command of their armies to those illustrious laborers, taken from the plough. Cincinnatus was found working in the field, by those who came to salute him dictator; Marcus Curius, after having conquered the Sabines and Samnites, and driven Pyrrhus out of Italy, was possessed of only one small farm, which he cultivated himself." A fine example both for Whigs and Jackson men. Scipio Africanus, after having defeated four of the greatest Carthaginian generals, and even Hanibal himself, took up his spade and ditched—not, I presume, "like a nigger," but like a white man, and a great man. He was of a different way of thinking from our little overseer, just mentioned. There is a wandering tribe of work-haters among us, who are a serious pest to every neighborhood. They are perfectly acquainted with the minute geography of every plantation: there is not a grape or persimmon tree, that is known to the most aged opossum, but what they are perfectly acquainted with; they know the negroes, hogs, and sheep of every plantation, as well as the owners; they can tell of all the Saturday night marriages, and the Monday morning whippings, that are transacted throughout the neighborhood; who hath a negro in the woods, and how many stripes he gets on coming home; how old aunt Sukey tongued the overseer, and uncle Tom escaped from his master's cane; they are famous for bush caucuses, fence conversations, five-corn gambling, knife-swaps, and button sales with the greenhorns among the Cuffees. These are they, who are so far below envy, that are so high above work. I know not such mortal cancers on the body politic as these. They fasten more especially on the property of the virtuous poor, and suck them to the dregs. They are ever trotting from one house to another, and scenting out the meat which his industrious neighbor has laid up for his family, and nothing short of a kick would drive him home till after dinner—and when he gets seated at table, fairly or unfairly, asked or unasked, he never rises until he sees the end of all things. They trace their pedigree up to great granddaddy, and down to the tenth cousin, not after honorable blood, but to enlarge their range for sponging: they are going from county to county, from neighborhood to neighborhood, eating out their poor kin, and driving them to the west. These itinerant idlers are roving under the pretence of "getting jobs:" but it is a job of eating, and not of work, they are after. They threaten worthy characters with constables—talk the loudest of liberty and equality on court-days and musters, and swear they are as free men as any—aye, the very freest, to be sure, if freedom from work constitutes liberty. They abuse the rich for being proud and aristocratic, because they wont play at five-corns, and dance a jig with them over a potato cellar,—"how do ye do" with them over a cup of villainous whiskey, and acknowledge them as equals. These are the characters (would you believe it) that are most ashamed of honorable labor.

I. R.

A PRECOCIOUS HEIFER.

To the Editor of the Farmers' Register.

24th June, 1836.

* * * I cannot lose this opportunity of informing you of a singular fact which happened in the vicinity of Hampton very lately. Capt. Spencer Drummond has a heifer of the Durham stock, only fourteen months old, which has a calf about a fortnight old, and is a much finer calf than we commonly meet with in this neighborhood, or in yours. I mention this because I consider it unprecedented.

ACCOUNT OF THE LATE ROBERT BARCLAY, ESQ. OF URY, A CELEBRATED AGRICULTURIST.

Extracted from Mr. Robertson's Agricultural Survey of Kincardineshire.

But the man who exerted himself most for the improvement of the country; the man whose labors in agriculture were the most strenuous and well conducted; and whose example had the most prevalent and most extensive influence, was the late Mr. Barclay of Ury. His, indeed, were no common powers. Of the most athletic form of body, endowed with the most ardent, energetic, and comprehensive mind, he employed his great talents as an agriculturist with the most unwearied perseverance, and to the happiest and most beneficial results. The subject which he had to work upon and to improve, or rather to subdue, was of the most obdurate nature, and to most people would have been unconquerable. But he was not of a nature to be intimidated. Difficulties tended only to excite his activity; and, adhering tenaciously to his own preconceived and well adjusted plans, he was ultimately successful.

The estate of Ury, the chief subject of his improvements, lies on both sides of the water of Cowie, and extends from Stonehaven, in a northwesterly direction, for nearly five miles. The house of Ury is situated about a mile and a half from Stonehaven, on the north banks of the Cowie. This rivulet, whose banks have been destined to receive so much embellishment from the hands of Mr. Barclay, is a small trouting stream, in general of no great capacity; but there are times when the mountain torrents, from which it is derived, come down so suddenly, and with so much impetuosity, as to swell it, in some places, more than twelve feet above its usual level. Happily, however, at Ury house, where this occurs, it is confined within strong natural bulwarks of rock, so as to prevent devastation.

Mr. Barclay succeeded his father to this estate, in the year 1760. At that time there was, except a few old trees around the mansion house, scarcely a single shrub of any value on the whole property. The Cowie, which runs for above three miles through the lands of Ury, had, in the lapse of ages, worn itself a deep channel; the land on either hand shelving towards it, in an angle more or less acute, in proportion as the soil was more or less adhesive. In general, through the whole extent of this course, springs of water from the circumjacent grounds were continually oozing to the banks, and forming into marshes and quagmires, which from time to time burst, and were precipitated, by land slips, into the river. Thus, every year the banks were becoming wider, by the breaking down from the overhanging braes of some new piece of land, to be slipped, in its turn, into the stream, which, being periodically flooded, swept the whole into the sea. The only product of these banks was a few natural alders, of no value whatever, and a coarse kind of aquatic herbage, to which cattle had hardly any access, and on which, if they had, they would scarcely have fed.

The arable land was divided into a number of small farms, each having a right of pasturage on the contiguous hills. The tillage was superficially performed with very imperfect implements. Almost every field was incumbered with obstructions of one kind or other—such as, pools of stagnant water—quagmires, where the cattle were ever in danger of losing their lives—great baulks of unploughed land between the ridges—but, above all, stones abounded, not merely on the surface, but through the whole depth of the soil. There were no enclosures; no lime was used as a manure; and the only crops were bear and oats. There was no cart nor wheel-carriage of any kind; nor was there even a road. In short, no place at that time abounded more in the evils attending the ancient system, nor enjoyed fewer of the advantages of modern husbandry, than the lands of Ury.

Mr. Barclay, who had acquired his ideas of agriculture on the fertile plains of Norfolk, could ill brook a state of husbandry like this. So soon, therfore, as he succeeded to the estate, he set about its improvement in a style which soon appeared to be neither superficial nor fleeting, but, to the utmost degree, radical and permanent. For this purpose, in addition to the lands that were at all times in the hands of the family, he took into his own management all the farms in the vicinity of the mansion, as the leases expired. And as none of them were of long endurance, he had, in the course of about 30 years, improved most thoroughly 903 acres of arable land, besides planting from 900 to 1000 acres with wood. Of the above quantity of arable land, there were originally about 300 acres, which were altogether either marsh or heath. Of the remaining 600, which were let to tenants, about one-fourth part, or 150 acres, consisted of baulks, wastes, marshes, and pools, interspersed through every field; the quantity in actual tillage never having exceeded 450 acres. So that, on the whole, Mr. Barclay has meliorated about 450 acres, and brought them, from a very imperfect, to the most correct state of culture; and improved, from a state originally of the most barren and forbidding appearance, about 450 acres more, which are now in a high degree of fertility.

The means by which all this has been accomplished, will form the subject of the following investigation, and fall to be related under these different heads. 1. Draining. 2. Trench-ploughing. 3. Removal and disposal of stones. 4. Application of lime. 5. Enclosing. And, 6. Rotation of crops. Plantations will form the subject of a separate section; as will comparative value, another.

1. *Draining.*—This primary step towards improvement was so indispensable on the lands of Ury, that out of 52 fields, into which Mr. Barclay divided his improved lands, there was only one in which draining was not required. The sub-soil of nearly the whole was also of such an adhesive nature, that the spring water could not filter through, nor draw to any considerable distance. So much was this the case, that it was frequently requisite to form the ditches within a few yards of each other, before the purpose of complete drainage could be accomplished. One field, consisting of 25 English acres, is, in particular, still pointed out as a remarkable instance of this. It cost £150 for merely the opening of the ditches, though these were contracted for at the low rate of three farthings the ell. This gives 48,000 ells for the field, or 1920 for the acre. And if we suppose the ditches to have been two and a half feet wide, (and, in such a marshy soil, less would not have kept them from falling in,) the ground thus cast up would amount to more than one-third part of the whole mass; and the drains must have been, at the average, within less than five feet of each other. To this expense of opening or casting the drains, there falls to be added, the expense of filling with stones and covering again with earth. The filling with stones, at the rate of one cart-load to three ells, would require 16,000 such loads; a large part of which, if not the whole, must have been brought from a considerable distance, as it is more than probable the marsh could not, of itself, furnish such a quantity. This labor, together with the expense of laying the stones in the ditches, and covering them with earth, cannot, on the most moderate estimate, be calculated at less than double the first expense, or £450 for the whole; thus making more than at the rate of £20 the acre for draining alone. The field itself, having been thus so completely turned inside out, has altered its aspect from its originally mossy hue, to a pale white, the color of the clayey sub-soil; which, having been thoroughly pulverized by trench-ploughing, and a copious application of lime, is now, not merely fully dry, but become considerably fertile. The total expense laid out on this field, would be little short of £40 the acre; for, independent of drainage, Mr. Barclay's other means of improvement generally cost him, per acre, about £18. This expense, in the present instance, would probably do more than purchase the land after it has been improved, and would certainly have deterred any common cultivator from making the attempt. But Mr. Barclay was not a man to be easily moved from his purpose; and, having once resolved to bring his whole lands into a full state of cultivation, this field, which would otherwise have remained a blot on the surface, would not have been left unimproved although it should have cost ten times the sum.

Mr. Barclay's drains were generally two feet and a half wide at top, ten inches wide at bottom, and about three feet deep. Less dimensions as to breadth might perhaps have served every purpose of draining; but the expense of casting them would have been very little, if at all, diminished by narrower ditches. For in a soil, of which one half the substance consists of stones and gravel, and the other half of an adhesive clay intermixed with these, it becomes impracticable to cast a very narrow ditch. To this it may be added, that as the lands of Ury had such a profusion of stones on the surface, it became a relief, in the trouble of clearing them away, to have large ditches into which they might be put.

2. *Trench-ploughing.*—The next operation was trench-ploughing; and there were two objects in view from this labor; 1. To acquire a depth of soil; and, next, to get rid of stones: and the work was persevered in till both were accomplished. Previous to Mr. Barclay's operations, the quantity of stones upon the lands of Ury was, as has been already stated, immense, both on the surface and through the whole depth which the plough had ever reached. The tillage had been but superficially performed; nor, indeed, had the tenants either skill or ability to perfom it better. But Mr. Barclay soon made his lands assume a different appearance; and from being the most incumbered with stones, and from having the thinnest staple of soil, they became the least incumbered, and of the deepest soil in the county. This was not, however, an easy acquisition, nor was it accomplished at little cost. With a set of uncommonly strong implements, and with six, and sometimes eight, heavy horses in the draught, he made the plough to descend, in spite of every obstruction, sixteen or eighteen inches at once; and, after carrying off the stones, as they were turned up, as from a quarry, he repeated the operation, till, in the end, he obtained a free soil of fourteen inches deep, and of a mould fit for every agricultural purpose. The quantity of stones thus removed was in general very great, and in some cases, almost incredible—even to the amount of more than a thousand cart-loads from an acre. And the surface of the land itself was observed to have become evidently ten or twelve inches lower by the operation.

3. *Disposal of the Stones.*—This would have been a work of weary labor, had not Mr. Barclay found out beneficial purposes for almost the whole. The draining, already noticed, consumed them in myriads. Perhaps more than 100,000 cart-loads, or 100,000 tons weight, were thus disposed of. On this point, however, one can speak only from probable conjecture; for, of such a multifarious distribution, no account was ever attempted to be kept. But, judging merely from the vast extent of drains that were made in progress of this branch of improvement, over nearly 900 acres, and which certainly amounted to several hundred thousand ells, the quantity of stones requisite to fill these could not be less than as now stated, but was probably much greater.

It has been already remarked, that when Mr. Barclay succeeded to the estate, there was not a road on it. But as he clearly perceived that well made roads, so essential to all improvement, were indispensably required at Ury, so he set about the construction of them without delay, and was assisted in this useful work by the statute-labor of that district of the county. The length of road altogether, that was thus made through his lands, with all its ramifications, extends to about eight miles, and consumed, to good purpose, many thousand cart-loads of stones.

He had another expedient still, namely, the filling up of hollows and pools. This is a branch of improvement that does not fall in the way of every cultivator; but Mr. Barclay had it in abundance. The inequality in the surface of many of the fields of Ury is still very apparent; but it was much more so before he dressed them in their present form. In almost every field there were deep hollows, which in the winter, or in rainy weather, became pools, some larger and some less, of stagnated water. These did not owe their origin at all to springs, but existed merely in consequence of their situation, incumbent on an adhesive subsoil that admitted of no filtration. In the winter they were always full, but grew less as the season became drier; and some of them, in the prevalence of the drought of summer, became, through evaporation alone, altogether dry.

It is evident, that whatever might be the produce of coarse herbage that might occasionally grow in these hollows, or by the margin of these pools, there could be no crop of grain raised from them. But this was not adapted to Mr. Barclay's ideas of the use of soil, and he resolved to rid himself of them at once. His method was this:—He first caused a trench to be made, no matter to what depth, till he laid them completely dry, and thus got access to the soil at the bottom. This soil was generally of a considerable thickness, and had been acquired by a gradual accumulation of the finer particles of soil that had been washed down from the conterminous heights, and had been rendered of a still more fructifying nature from the residuum of the vegetables which, from year to year, had alternately grown up and decayed upon their margin. This was too valuable to be lost. He therefore caused it to be cut out, and to be either carted or wheeled out with a barrow, beyond the limits of the hollow. The next work was to cast in stones from the contiguous fields, and to fill it up, not merely for the space occupied by the soil now taken out, but to as great a height as the water was wont to stand in the winter season. The last operation was to carry back the excavated soil, and spread it upon the surface of the stones. Thus, a noxious pool was converted into soil the most valuable in the field. I am credibly informed, that, in many of these old pools, the quantity of stones carted into them is upwards of six feet in depth: and that the number of such instances of improvement, from that extent downwards to that of two or three feet of filling up, is very considerable indeed.

After all, these three ways of disposing of the stones, though they must have consumed a quantity almost inconceivable, have not been able completely to swallow them up; for, so very much did they abound originally, that many thousand cart-loads are still to be seen, that were tumbled, as the last resource, over the banks towards the channel of the river.

4. *Application of Lime.*—After the various and expensive operations of draining, trench-ploughing, and removal of stones, immediately followed the application of lime. Previous to the era of Mr. Barclay, the use of lime as a manure was, in this county, very circumscribed, though not altogether unknown in this respect; but, in these days, its powers appear to have been overrated. This may be inferred from the practice which then prevailed, of sowing it over the surface by the hand from a sheet, by which means, a few bushels were made to overspread an acre. The effect which this meagre sprinkling had upon the soil, is not indeed stated; but it could not have been considerable. There is, however, more reason to admire than to despise, in this particular, the exertions of those ancient husbandmen, when we reflect on the state of the roads at the time, by which the carriage of three bushels in a bag, on the back of a horse, was a work of greater labor than now to bring on a cart, three bolls. It may be remarked also, that the thin staple of earth which they had to manure, would require a proportional less quantity to produce an effect. But, be this as it may, the soil formed by Mr. Barclay, being so much deeper than the general soil of the country, required a more liberal allowance of lime, and he gave it a more liberal allowance accordingly. He never applied less, in any case, than forty bolls of shells to the acre, but more generally from fifty to seventy bolls; so that the average may be justly stated at sixty bolls to the English acre. In one particular case, viz. in his garden, which he had trenched to the depth of five feet, he applied no less than at the rate of five hundred bolls to the acre;—a quantity probably more than enough to saturate the whole mass; and, of course, a misapplication, so far as the excess might extend. The boll here specified is what is called the water measure (from being used on shipboard), or Stonehaven barley measure, of 33 Scotch pints to the firlot, or 132 to the boll.*

This bountiful application of lime seems to have had the desired effect; for, during the whole time of Mr. Barclay's practice, which extended to a period of 38 years, he never had occasion to apply lime a second time, except in two instances, in which, as the first application did not seem to operate so powerfully as he expected, he repeated the dose.

The lime which Mr. Barclay generally made use of, was imported at Stonehaven from Lord Elgin's limeworks, at Charleston on the Frith of Forth. Stonehaven may be about a mile and a half, at an average, from the different fields to which it was to be applied. This easy distance of land-carriage was a favorable circumstance to his improvements, and almost the only favorable one that attended them. The price of lime was, at first, only 1s. 11d. the boll: it was afterwards increased to 2s.; from which it rose, penny by penny, till it came to 2s. 5d., which was the highest rate that Mr. Barclay had ever to pay. These all seem moderate rates, when compared with 3s. 8d., the present price (in 1807). But this is only a seeming, not a real cheapness; for if we compare the different prices of lime with the prices of labor or of grain, at the different periods, there can be little doubt that 23 pence in 1760 was fully equal in value to 46 pence in the present year.

As Mr. Barclay applied lime to 903 acres on this estate, and limed about thirty acres a second time, and all at the rate of 60 bolls an acre, on an average, the quantity altogether thus made use of will be found to amount to 55,780 bolls; and this, at 2s, 2d., the medium rate of price per boll, will amount to 6064*l*. 10s. as the prime cost of the lime.

Mr. Barclay's importation of lime was not, every year, in equal quantities. In some years it did not exceed 1000 bolls; in other years there were more than 2000 imported; and, one year, the importation is stated at 4000 and upwards,—thus varying as the exigency of the case required. In like manner, his successor, who inherits a goodly portion of his father's ardor and energy of mind, had in one year, lately, as much land under a course of improvement, as to require an importation of 6000 bolls of lime-shells at once.

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* The boll is rather more than 4 bushels. See Scottish measures p. 98, vol 1. of Far. Reg.—Ed.

5. *Enclosing.*—When Mr. Barclay succeeded to Ury, there was not a single enclosure on the whole estate. Indeed, in a country where artificial grasses are unknown, and where the only pasture among the arable lands consists of wastes, baulks, and marshes, scattered in various directions, of every size, and in every kind of irregular shape, among the different corn fields, enclosures can make no part of the system. In fact, they could be of no use; for no beneficial application of them could be effected. A country enclosed must always be a country that, in other respects, has undergone some degree of improvement.

Mr. Barclay, in the course of improving his lands to the extent already stated, caused them to be enclosed, field by field, as soon as the previous meliorations had taken place. The whole estate is divided into fifty-two enclosures of various sizes, from fifteen to thirty-five acres, with only four fields below the first size, and five that are above the second. The least field is of four acres, and the largest of sixty. The fences are almost all of ditch and thorn hedge; the one serving as a ready conveyance to the water, and the other as a shelter for the cattle. Very few of the fences at Ury are composed of stones, notwithstanding the superabundance of that material, which lay originally at hand upon every ridge. But the stones, there, were little calculated for building, being all round, water-worn bullets, very inapplicable to a wall of any description, either with or without mortar. Most of the thorn fences have thriven exceedingly. They are, in fact, too luxuriant, some of them being little less than twenty feet high. This height gives excellent shelter to the cattle; but has a bad effect upon the hedges themselves, as the lower part, being too much overshaded, becomes open and unfencible, and requires much care, by the application of paling from time to time, to keep the cattle properly confined. It has been remarked, in general, on this branch of Mr. Barclay's meliorations, that his fences have been more accurately constructed, and more attention paid to the rearing of them, in the latter part of his improvements, than in the beginning—a circumstance which ought to be expected, as his hedgers would naturally become more expert, and perform the operations more correctly, the longer they were accustomed to the work.

A circumstance in the construction of the gates is worthy of notice, which is, that the horizontal bars are set edgeways up and down, and thus afford, by their position, the greatest strength from a given weight of wood. This may seem so obviously the best mode, as to require no particular remark; yet it is astonishing how little such minutiæ are attended to.

6. *Rotation of Crops.*—After the lands were brought into tilth, and had a due application of lime, Mr. Barclay's first crop was oats; after which began his general rotation of a four years' course—1. Turnips; 2. Barley; 3. Clover and other grasses; 4. Wheat; then turnips as at first.

Though wheat is stated as the last in the course, I shall begin with it—as part of the culture bestowed on it, in the course of the rotation, was preparatory to the crop of turnips which followed.

Wheat.—This was sown on one furrow from lea after the clover, the ground being previously dunged at the rate of twelve three-horse cartloads of well made farm-yard muck to the English acre. The time of tillage was from the first of October to the middle of November; the quantity of seed nine pecks to the acre, or about two and one third Winchester bushels. The produce varied considerably, according to the seasons. It was, in some years, not more than five bolls; in other years, it was ten: but on an average of years, it amounted to about six bolls and a half, or twenty-seven and a half Winchester bushels, from the English acre. The measure here understood is by the Stonehaven peas firlot of twenty-two Scots pints; being thus about three and a half per cent. more than the Linlithgow standard. Mr. Barclay, by the time his improvements had extended over most of his lands, had, in some years, 130 acres in wheat.

Turnips.—Mr. Barclay having applied the dung to the preceding crop of wheat, left nothing to be performed to the turnip land but the tillage only. This gave him a great advantage in the operations of that busy seed time, in which celerity in the progress is frequently more conducive to the prosperity of the crop than any other circumstance.

The ground, being brought into a complete state of pulverization by frequent ploughings, was sown, in the first and second weeks of June, by broadcast, at the rate of one pound weight of seed to the acre. This fashion of sowing the seed, Mr. Barclay had learned in Norfolk, and persevered in it to the last; and, from the very abundant crops which he always raised, it has become matter of doubt with some people, whether to sow broadcast, or in drills, the now general practice, be the most judicious and advantageous method. The greatest objection, perhaps, to the broadcast system, arises from the difficulty, in that mode of culture, of cleaning the land from weeds, as it admits of aid, neither from machinery, nor from the power of animal draught, to assist in the operation; but all must be performed by manual labor alone. Mr. Barclay's land, however, was *previously* so fully pulverized, and so free of all weeds, either from root or by seed, that very little hoeing was required. The only thing almost to be done, in his fields, was to set off the turnips, by thinning, to a proper distance; a work, indeed, that required no little dexterity. Mr. Barclay, however, had his people so well trained to this nice operation (in which he was remarkably expert himself,) that they could, each of them, go over half an acre in a day; so that, although he sometimes had 130 acres in turnips, the work of thinning, which was constantly done by the hoe, was always accomplished in due season. The crop, in consequence of thus meeting with no neglect, prospered exceedingly; and the plants set off by three different operations—first at three, then at six, and lastly at twelve inches distance, turnip from turnip—soon filled the whole surface, and grew to be a crop of from thirty to forty-five tons weight the English acre. The crop would indeed sometimes exceed the last, but never fell short of the first of these quantities. This vast supply of green food was consumed in two ways—in the fattening of cattle, and the feeding of sheep.

Cattle.—Of cattle, Mr. Barclay had two sets. One set of from five to seven years old, and weighing, each, from forty to sixty stones, at sixteen lib. to the stone Amsterdam, was bought in annually, in the months of July and August. The number of this class was from sixty to seventy, which were picked up in the different fairs in the county or neighborhood, at from 10 to 12*l.*, a piece. They were first laid upon his clover fields, then on aftergrass from the first cutting; and in the course of the season had also a range over the whole stubble land, till about the middle of October, when he began to draw the turnips for them, from the different fields or enclosures under that crop. His method was, to draw alternately from one half to two-thirds of the surface on the *best* of the land, and to leave the remainder to be eaten on the ground. On the inferior parts of the field, however, he left the whole to be thus consumed by the cattle or sheep (afterwards mentioned), which continued on the spot while the crop lasted. By this method, the least fertile portions of the lands were rendered, for the succeeding crop, nearly as productive as the very best.

These cattle were never fed in houses or in stalls, but at all times in the open fields, to which the turnips were carted, and spread over the surface; and there enriched, by the manure dropt, other parts of the grounds, to an extent equal to half of that on which the turnips were produced. This practice, however, is not applicable to every situation. The general inclemency of the winter season would render out-doors' feeding impracticable in most cases. But the lands of Ury having a hanging exposure, open only to the south, and intersected by different glens or hollows, are remarkably well sheltered from the storm, from whatever direction it may come; and care was taken to shift the cattle from field to field as the weather required. The lands, too, are particularly dry; so that no bad consequence, from poaching, can arise either to them or to the cattle.

This lot of cattle was fattened off in the course of the winter, and sold, from time to time as they were ready, to butchers from Aberdeen, at from 15*l.* to 18*l.* each, then weighing from 50 to 72 stones a head. Some of a larger kind, bred by himself, were, after the turnips were done, kept on upon the grass till about the end of June, when, weighing from 80 to 84 stones each, they were sold at from 20*l.* to 21*l.* a piece.

Mr. Barclay had another set of cattle of an inferior sort, which he bought in, in the month of October yearly, to about the number of four score. They were generally three years old rising four, weighed from 30 to 40 stones, and cost from 7*l.* to 8*l.* each. These were put into the straw yard, for the purpose of consuming straw and making muck. They were, however, brought out occasionally to the turnip fields, and had a picking from those left by the larger oxen. They got from time to time a larger share, in proportion as the greater cattle were sold off; till, in the end, when the turnip crop was all expended, they were put on the pastures, and completed their feeding by the months of June or July, when they weighed from 40 to 50 stones, and were sold at from ten guineas to 12*l.* each.

Sheep.—Mr. Barclay bought in about 300 wedders yearly, in the month of October, from the Highlands of Bauffshire, by the water of Avon, in the parish of Kirkmichael. These were a healthy and hardy black-faced breed, weighed about 12 lib. a quarter, and cost about half a guinea a piece. They were first pastured upon the stubble grounds and after grass, till they learned to eat turnips, which were daily portioned out to them till they fed upon them freely. After this, they were taken from the pastures entirely, and put into the turnip fields, where they fed in flakes erected for the purpose, and in which they had a small quantity of hay in racks. Both flakes and racks were moveable, and were carried from field to field, and from place to place in the same field, as occasion required. These wedders were disposed of from time to time, as they got into condition; beginning by the first of January, and continuing till the first of April; by which time the whole were sold off. The price was from 14s. to 16s. each, and the weight from 13 to 14 lib. the quarter; the advance upon the price having arisen more from the rise in the value of mutton in the market, than from any advance in the weight of the animal.

Mr. Barclay had also a flock of from 250 to 300 breeding ewes, which he kept generally on the unimproved part of the estate, but brought occasionally, in severe weather in winter, to get a share also of the turnips. About 60 or 70 of the oldest of these were kept on the turnips the whole season over, till they had reared their lambs, which were in general so early ready, as to be sold, from the end of March to the beginning of May, at from 10 to 12s. each—reckoned a high price then, about the year 1780. His method of rearing these lambs was somewhat singular. They were kept constantly in the straw-yard, among clean litter, and under the shelter of a shed; but the dams were turned out to the fields to pick up their food among the turnips, from which they were brought home twice a day, and all night to give suck. By this means, the lambs were always kept under shelter from bad weather, which no doubt contributed to their thriving, and made them sooner ready for the market. After the turnips were all consumed, these ewes were turned to the pastures during the summer, where they got fat generally by the end of July, or beginning of August, when they were sold at about 12s. each.

The labor required in this system of feeding was wonderfully little. Three men, with two carts and four horses, served for the whole purpose of carting off the turnips. One man drove them off, with three horses in the cart, to the different places where they were to be spread. Two remained on the field, pulling the roots, and packing them into the cart that remained with one horse. When the carter returned with the empty vehicle, he left it with the horse in the shafts, to be filled in its turn, and with the two tracers now yoked before the other horse in the full cart, set off, in full strength, with the loading. In this manner they wrought from morning to night; taking care always to leave the two carts full at night, to be early distributed in the morning, before a new supply could arrive. Two men more were sufficient to tend the whole quantity of sheep.

Barley.—This succeeded in rotation; and, from the fine order into which the land was previously put, never failed to be a good crop. The quantity of seed was eight pecks (about three and one sixth

Winchester bushels), and the produce about seven bolls (about forty-four bushels) at an average, the English acre. The firlot from which the barley boll is measured, contains, in the vicinity of Ury, 33 Scots pints, which is about six per cent. above the Linlithgow standard.

It was with this crop that the seeds were sown for the succeeding clover crop, at the rate of a bushel of rye-grass seeds, and from ten to twelve lib. of the seed of red clover. Such were the quantities used when the land was intended to be one year only in grass; but when it was meant to remain for pasture, there was added a portion of white and yellow clover, together with some rib-grass seeds.

Clover.—This was the last crop in the rotation. About two-thirds of the lands thus sown out were reserved for hay, for which the proportion of rye-grass sown among it properly fitted it. This was partly cut a second time in the same season, and partly pastured after the first crop was removed. The other third part was pastured from the beginning, as the great number of cattle kept on the lands required to be provided for accordingly.

In this manner, for two or three, and in some cases, four courses of this rotation, did Mr. Barclay employ his improved lands. At last, however, he laid them down wholly in pasture; in which they continue to this day, being among the very best in the county. The pasture grounds are let from year to year to cattle-dealers, and fetch a rent of from forty shillings to two guineas and a half the English acre.

Plantations.—The most brilliant, perhaps, of all Mr. Barclay's achievements, at least that which most adorns the face of the country, was his plantations. These were formed at a moderate expense, and yet have every appearance of becoming the most valuable part of the property. And thus combining embellishment with utility, he obtained, at the least original disbursement, the most lucrative prospect in future.

Mr. Barclay, from the first, had a propensity to ornament Ury with growing timber. Even in the lifetime of his father, he projected and carried into effect some embellishment of this kind, in the vicinity of the mansion, which was then but scantily sheltered with wood, while there was not a single tree on any other part of the estate. This project, however, the old gentleman did not much relish; partly, because it was an innovation; and partly from a regard to the welfare of his sheep, which were thereby curtailed, in some measure, of their pasture. Young Mr. Barclay, however, persevered in his intention; but was obliged to compromise the matter with the sheep, by leaving them free access to the pasture; which put him to the charge of fencing each tree with three stakes and connecting paling, to guard it against depredation. This young wood prospered greatly; and many beautiful trees in it are still pointed out, which he planted with his own hands. This happened about the year 1756.

This successful experiment encouraged him to extend his plantations; which he did upon a great scale, when, in a few years, he came to the possession of the estate, and had the means of gratifying, uncontrolled, his taste for this ornamental branch of husbandry. The ground which he first fixed on for this purpose, was the banks of the water of Cowie; which, as already stated, flows for about three miles through the lands of Ury. Through this whole extent, there is a bank shelving on each side towards the stream, on an angle more or less acute, but all too steep for tillage. These banks are, in some places, thirty yards in breadth, and in others, one hundred yards or more, from the water edge to the top of the declivity. Both sides taken together, will at an average, extend to about one hundred yards in breadth on the base; and thus in the course of three miles, will amount to fully one hundred acres.

The whole of this is thickly planted with deciduous trees, or what is here called hard wood; in distinction from the evergreens or firs, whose timber is comparatively softer and of less value. There are, indeed, a few spruce and silver firs planted near the upper margin, to afford shelter in that more exposed situation. But through nine parts in ten of the whole plantation, there is only hard wood, such as oak, ash, elm, &c. These are abundantly sheltered by the natural warmth of the hollow, which is rendered still more mild from its various windings, occasioning one part to be continually protected under cover of another, from whatever quarter the wind may blow. Nothing can exceed the prosperous state of this beautiful plantation. Many of the trees are already nine or ten inches in diameter, and from twenty to thirty feet in height below the branches; and there does not appear to be a misthriven one among the whole; amounting to perhaps 400,000; but there is every rational prospect of, at least, one fourth part coming to complete maturity. The ultimate value must be very great; nor can that prospect be at any great distance of time. In less than half a century hence, the timber wood on this river side (extending to the moderate quantity of 100 acres) will be worth more than all the conterminous 900 acres of arable land put together;—perhaps to more than even the whole arable part of the Ury estate. This assertion will not be deemed too rash, when we reflect that hard wood is now selling at from three to five shillings the cubic foot; and that many thousands of the trees in this plantation contain already more than ten cubic feet of timber each.

It has already been said, that this improvement was obtained at a moderate expense. The precise amount, however, cannot, at this distance of time, be ascertained; but it is not difficult to conceive pretty correctly what it might be. The disbursements, which neither included trench-ploughing, lime, nor removal of stones, would be limited, 1st, to draining of the swamps that originally existed in various places in the banks, and which, from the sloping situation, would admit of great facility in the operation; 2d, of enclosing with ditch and hedge; 3d, of the value of the young plants; and, lastly, of the labor of pitting and planting them;—all which, at the moderate rates that prevailed about thirty-five or forty years ago, may be safely estimated at a sum not exceeding two pounds the acre, or 200*l.* in all.

Again; the annual value of the land thus given up to planting, falls to be added to the estimate, which will be the greatest article in the account. But this will not, after all, exceed £20 a year, or 4s. the acre; which considering the general worthlessness of the pasture, conjoined with its general inaccessibility, will not be deemed too low a rent. If we take the pains to calculate, on the common principles of arithmetic, what all this may amount to, at compound interest, forborne 70 years, which we may, from what is already seen, set down as the period of perfection in the wood—it will come to £17,856. But this sum, considerable as it may in this view appear, is little indeed, compared with the value of 100,000 trees, that may then be reasonably expected to have attained to such a state of maturity as to be worth more than twenty shillings each, at an average.

Besides this plantation on the banks of the Cowie, there are others of hard wood in various clumps, belts and hedgerows, around several, of the enclosures. There is likewise a beautiful den planted partly with hard wood, by a small rivulet which flows from the north towards the house of Ury. Altogether, in this den, and in the different clumps, belts and hedgerows, there may be about sixty acres of plantation; and of this there may be about one-third part of hard wood, with two-thirds of different kinds of fir intermixed. The whole is in a very prosperous condition; and, besides being highly ornamental, and affording much shelter, must ultimately be of great value.

The most extensive, however, of the woods of Ury are entirely of fir, upon the hill sides and hill tops of what may be called the back ground of the improved part of the estate. There, Mr. Barclay has planted upwards of 800 acres. These hills, thus clothed with wood, being of considerable altitude and seen from far, have a very happy effect in enlivening the general aspect of the country. The wood itself, however, is not all thriving. In the lower parts of the hills, where the soil is tolerably good, and where the exposure is not too severe, the firs are doing well, and have every appearance of being valuable; but, further up the hill, they get worse and worse; till, at the utmost summit, they have nearly failed altogether. This is owing, in a great measure, to the extreme sterility of the soil on these high and bleak situations; but in part also, to Mr. Barclay himself having made an improper selection of the kind of wood. He had an ill-judged partiality for the Scotch fir, esteeming it the most hardy of the pine race, and the most adapted to the climate of the country. This induced him to plant these more exposed places, almost exclusively, with this kind. Time, however, has shown, that the Scotch fir is not all a hardy plant, but among the most delicate and feeble of the fir species; and will thrive no where, unless it be in some favorite situation, such as in the deep glens in the interior of the highlands, where, there can be no question, it grows to a large size, and is a most valuable timber. In all plantations, however, along the eastern coast, the larix seems a much more hardy tree, and better adapted for an alpine exposure. Of this there is a striking example to be met with at Ury itself; where a small plot, planted with larix on the top of one of the hills, continues still vigorous and thriving; while all around, the feeble Scotch firs, after thriving a few years against the sterility of the soil, and the coldness of the exposure, have dwindled down to the size of juniper bushes.

It may be observed, with regard to the plantations on the hilly parts of Ury, that although they cannot be compared with those raised on the lower grounds, yet there is still such a considerable proportion that continue in a thriving condition, as must make them, on the whole, a very profitable concern. The original expense of planting would probably not exceed 15s. the acre; while the value of the pasture on such a wretched soil, can hardly be estimated at any thing at all. So that the whole expense, even calculating it on compound interest to the present day would not exceed £2500; a sum far less than the present value of the thriving part of the plantation, were it appreciated at only sixpence a tree.

When Mr. Barclay commenced his operations, in the year 1760, he employed only the people of the country, that were bred on his own lands, or in the vicinity. At this time the scene of his improvements was very limited in extent, and the number of his work-people not great. But in proportion as he acquired the occupation of more of his own lands, his improvements expanded more widely; and more people, from the neighborhood, to carry them on, were required. These, however, were of a cast not altogether to his mind; for he did not meet with that alert service from them that corresponded with his own ideas of activity. This set him upon getting servants from a more enlightened part of the country; and accordingly he engaged some from the county of Norfolk in England. With the assistance of these English servants, he set himself to the training of his own people to a more dexterous habit of working, and to a more thorough knowledge of his operations; some of which, such as draining, hoeing, planting, enclosing, &c. were entirely new; and all of them being on an improved principle, were of course so far an alteration of the common practice. His discipline was severe, but it was very correct. He would admit of no slovenly practice—no slighting of the work. Nor did he require any thing of his people but what he could do himself; for while he delivered out his directions in the most clear and distinct manner, he could, with his own hand, show them the true mode of performance. He could even enforce his authority with something more effective than verbal injunctions; for it is said that the clownish obstinacy of his people was not unfrequently corrected by manual discipline. I have indeed met with different people that confess (and even in some measure glory in it,) that they had the knowledge of their work beat into them by Mr. Barclay. This strict government had the happiest consequences; for not a little of the general dexterity (to be afterwards noticed) in the Kincardineshire laborers, is still to be traced to the original system of their *education*, established by Mr. Barclay of Ury. His establishments was indeed very extensive. At Ury alone, he had, in general, from 40 to 60 people constantly employed, either in the common operations of husbandry, or in the extraordinary work of improvement. He employed also from 24 to 32 work horses. He never employed oxen. He could endure no sluggish motion; and his operations were all conducted in a style of too much celerity to admit of the slow pace of the ox.

Along with his Englishmen from Norfolk, he imported several of the Norfolk implements of husbandry; more especially the wheeled plough, and the large eight horse wagon. The first of these, as being unquestionably the most correct implement of tillage, at the time, met with a favorable reception in the country, and soon spread to a considerable distance. The more simple and equally effective Scotch plough, improved by Small, has now, however, almost entirely superseded it. The large wagon never came into general use; nor did it extend its influence beyond Mr. Barclay's own lands. It is too expensive and too unwieldy a machine to obtain much footing in Scotland.

Mr. Barclay's operations, however extensive on the lands of Ury, were by no means limited to that estate. His improving hand was stretched over a much larger expanse of country. On his other lands of Allardice, Hallgreen and Davo, situated about ten or twelve miles from Ury, he made many essential meliorations; though not to such an extent as upon Ury, which, being his favorite place of residence, he exerted himself more strenuously towards the decoration. He had also different places in lease to which his improvements were extended.

If we confine our ideas of the benefit conferred on the county, by Mr. Barclay's improvements, to the meliorations which he effected on the lands actually under his own management, his exertions, in this respect, must rank him high in the view of every intelligent and reflecting mind. But his value, as a cultivator, was not so circumscribed. There are other circumstances, that, as an agriculturist, have extended much further the circle of his usefulness. Among these may be stated the happy consequences, arising from his having instructed so many of his laborers in the most correct mode of cultivation, who, diverging in various directions, have carried the knowledge, thus acquired, to every place where they have been employed. To have been in the service of Mr. Barclay, always was, and still is, a great recommendation to any servant. Some of these have even advanced themselves into a higher class, and are distinguished as tenants, by a spirit of industry and exertion becoming the disciples of such a great master. His example, all along, had also a wide and extensive range. The fame of his improvements spread far; and the light thence diffused, has beamed in a thousand directions over the face of the whole land.

Comparative Value.—What may be the real value to the estate itself of Ury, from the improvments made on it by Mr. Barclay, is perhaps not very easy to ascertain. The only facts on the subject that I have to state are, 1st, That 47 years ago, when Mr. Barclay succeeded to the property, the rent of all that part of the estate which he afterwards improved, was £200 a year. 2d, That the rent now of the pastures, as they come to be let, year by year, runs from £2 to £2 12s. 6d. the English acre. The quantity of improved land is 903 acres; of which about 300 acres were entirely waste land, and afforded no rent at all. The improved land, however, is not all in pasture. There are three farms, comprehending 334 acres, which are under lease at a rent of from 25s. to 30s. the acre. The rent, however, of the whole estate, amounts to about £1650 a year; and there can be little question that, were it now to let, it would bring £1800, or nine times its original value. It must not however be disguised, that, owing to the fall of the value of money, this property would have rented, at present, though there had not a single improvement been made on it, at £400 a year. But this, at all events, leaves £1400 a year, as the increase of rent made by these improvements alone, on this part of the property. Now, though it should be made appear that Mr. Barclay's improvements should have cost him even more than a principal equal to the above £1400 as interest, yet, as there still remains the value of the plantations—a value that is rapidly increasing—there can be no doubt whatever that Mr. Barclay augmented his fortune by his improvements, very considerably indeed.

Mr. Barclay began his operation in the year 1760; and continued unremittingly to improve and embellish till about 1795. A year previous to this, being elected member of parliament for the county, in the room of Lord Adam Gordon, a stop was put, in a great measure, to his agricultural pursuits. He died April 8th, 1797, in the 67th year of his age.

From the Richmond Compiler of August 22.

OPINIONS ON THE PROPOSED SOUTHERN ROUTE FOR THE RAIL ROAD TO THE SOUTH-WEST.

Richmond must wake up!

The views contained in the article from the Farmers' Register,* have about them so much plausibility, and carry with them so great an air of sincerity on the part of the writer, that for such reasons they pre-eminently claim attention and reflection. Richmond is bound, by every obligation of interest and duty, to scrutinize well the purport and bearing of these remarks, and not permit her strong claims to be postponed or viewed as objects of secondary consideration. A strong feeling is at work in behalf of the most southern practicable route for the rail road; and unless we take an active part in the game about to be played, we may find that nature has been bountiful in vain. We should at least be represented in the proposed Charlotte Convention; and in the meanwhile our survey or reconnoissance ought to be made, in order that our delegates may be prepared to demonstrate, with the certainty of mathematical truth, every proposition made by them. Nothing should be left to conjecture or speculation. We have unjust prejudices to encounter. Let us not multiply difficulties by our supineness.

From the Richmond Compiler of August 23.

It will be seen that the rail road scheme to Lynchburg is beginning to warm up discussion and investigation; and well it may, for no subject is at this moment of more vital interest to Richmond. The writer under the signature of "Cary Street," has suggested some thoughts which deserve deep and careful reflection; and, with him, we think it may be well to consider whether our liberality to Petersburg, in agreeing to go round in that direction, may not be exercised at rather too great a sacrifice. Petersburg is but *twelve* miles from City Point—Richmond is *forty-five.* Produce once at Petersburg, no advantage which Richmond now possesses, can draw it here, if capitalists should think proper to locate themselves at the former place; and every one knows that "if the mountain will not come to Mahomet, Mahomet will go to the mountain." Carry the trade to Petersburg, and who will be so silly as to bring it to Richmond, adding the freight of *twenty* additional miles on the rail road, and *thirty* on the river? No one. And Richmond, with all her advantages, will be thrown in the back ground.

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* See last No. p. 309.

But we have no room to pursue the subject. The sagacious portion of the community, whose interests are in jeopardy, will, we doubt not, be on the alert. It certainly behooves them to look well to the conflict of the surrounding elements.

From the Richmond Compiler.

SOUTH-WESTERN RAIL ROAD.

Sir,—I have read with some attention the communication (from the Farmer's Register) in your paper of Saturday, on the best route for the above road, and really the writer appears to advance strong arguments on good foundation. His facts being correct, which I have no reason to doubt, why should not his conclusions be allowed?

It is desirable, perhaps necessary, to the speedy accomplishment of this great and important line, that a route should be adopted, which will unite all its friends; but this will not be done until a pertinacious adherence to local interests shall be relaxed. Let us then be willing to concede to others a fair proportion of the anticipated benefits, and go together as in the pursuit of a common cause, if it can be made so.

It should be no serious objection, and ought to be conceded, that our neighbors of Petersburg, if they can find the best route near them, should reap a share of its benefits. We of Richmond would certainly claim the same privilege, in a like case.

But let us examine what will be the bearing of this plan upon Richmond, should it be adopted. The road would be convenient enough for all who wish to visit our city, or go thence to the southwest. On the other hand, we have a line progressing to the Valley, which perhaps ought to pass through Charlottesville to Staunton; but, if extended to Harrisonburg, will secure the travel from the great channel of communication through Virginia, westward. Between these two, will be the James River Canal, to convey produce from both quarters; and really I think we shall be pretty well accommodated, and may be satisfied to yield to the towns on either hand, the share of travel and trade which will fall to them.

One consideration to recommend the southern line is, that it will be far enough from James River to remove, it may be hoped, the opposition of the Canal Company.

I have thus briefly noticed this subject, that some competent pen may pursue it, and if possible, reconcile the clashing interests, or promote a spirit of accommodation which will be ready to accord to others as much as we claim for ourselves. I hope that both Petersburg and Richmond will be fully represented in the proposed convention at Charlotte, with instructions to pull together in any measure where mutual interests can be promoted.

A STOCKHOLDER IN THE JAMES RIVER COMPANY,
AND FREEHOLDER IN RICHMOND.

From the Lynchburg Virginian of August 22.

A NEW SCHEME!

We have received a sheet of the forthcoming (September) No. of Mr. Ruffin's "*Farmers' Register*," in advance of its regular publication, and our attention is called to a long and well-written essay contained in it, professing to inquire, "which is the best route, through central Virginia, for a railway to the southwest;" but in reality laboring to show that neither of the two routes, the advantages of which have been recently so warmly discussed, is the proper one, and that both of them ought to be abandoned, for a third, which the writer suggests. This route lies on the ridge south of the Appomattox, commencing eastwardly at the Petersburg and Roanoke Railway, a few miles south of Petersburg, (with which town it would of course be thus connected,) and passing through Dinwiddie, by Nottoway Court-house, and nearly along the line which separates Lunenburg and Charlotte on the south, from Prince Edward on the north, *leaving Lynchburg out of the line, about twelve miles, and going directly on to New London*—and thence westwardly! The main arguments urged in favor of this route, are 1st, that between Petersburg and New London, if we keep on the dividing ridge, we shall not cross a single stream, ravine or hill; 2dly, that a road upon this route will accommodate a section of country, which, at present is without the benefit of commercial facilities; and 3dly, that it will be so far distant from other improvements as to lose the character of a rival to any, while the distance will not be at all increased. Richmond is urged to support this project, by the consideration that she will still be the ultimate destination of the trade, as she will be connected with Petersburg by a rail-road; and Lynchburg is told that she may have a *branch* from the main railway, "which will be necessary and *sufficient* to accommodate the Lynchburg travel." And this scheme is warmly urged upon the consideration of the Convention which is to meet at Charlotte court house on the first Monday in September next.

Is *Lynchburg* prepared to support this scheme? Whether she is or not, we cannot say, having yet had no opportunity to ascertain the state of public sentiment in relation to it. But whether she is or not, *should she not send a delegation to Charlotte court-house, to represent and defend her interests?* If she is willing to see the great rail road to the Tennessee line pass 12 miles south of her, let her say so. If not, let her at once protest against it.

But *Richmond*, it seems to us, is vastly more interested in this matter than we are, and she is much less sagacious in perceiving her interests than we suppose she is, if she accedes to this proposition. True, she may be told that she will be the "ultimate destination" of the trade and travel on this route: and she may be so at first. But how long will this state of things continue? No longer than a rail road could be constructed from Petersburg to City Point. Who, wishing to ship his produce to an European or a Northern market, would send it to Richmond, and incur the delay of a circuitous route and the expense of transhipment, storage and drayage, when, on its arrival at Petersburg, they could wheel the cars at once to City Point, and put it on ship-board? Men are not so blind to their interest.

The advocate of this new route, however, endeavors to lull the suspicions and fears of Richmond, with regard to the effect of rivalship from this quarter—and tells her. "*If she fears rivalship, let her look to Baltimore.*" Very good advice, we doubt not. But in what manner is Richmond to put down Baltimore rivalry by adopting this scheme? She may, it is true, check the growing disposition of the people of the south-western counties to connect with the Baltimore interest at Staunton—but can she wrest from Baltimore the trade of the rich Valley of Virginia of which Staunton is the centre? No. She can only secure the trade *both* of the south-west and of the Valley, by a rail road on the James River route, connecting with the Valley by a railway from Scottsville to Staunton.

We repeat the suggestion that it may not be unimportant that Lynchburg should be represented at the Charlotte Convention; and we hope, if our older and wiser heads think with us on this subject, that measures will be adopted to appoint delegates to that body.

From the Richmond Compiler.

WATER POWER OF RICHMOND.

We have been favored with the following extract of a letter, written by a gentleman well acquainted with manufacturing operations, having been engaged in that capacity in Pennsylvania for some time past. His opinion is entitled to weight; and we submit it at this moment, in order that it may receive the consideration it merits by the James River Board, now in session. Every one who has noticed our immense water power, will readily admit that high as it is rated by the writer, he has not made too great an estimate. Every visiter is similarly impressed, and every one wonders that such splendid advantages are permitted to lie idle. We doubt not the subject will receive early and proper attention from those who are now entrusted with the management of interests so important.

"I took as good a view of the water power as my limited time would allow; it is a stupendous power, and only requires adequate capital and proper engineering to make Richmond what nature intended she should be, one of the most extensive and important manufacturing points in the United States. I should think that the available water power at Richmond cannot be less than six times that of the water power at Lowell, which at present impels machinery that has cost, including active capital to carry on the works, more than six millions of dollars. But it is of the greatest importance that so valuable a privilege should not be cut up into petty sites. In this, the State of Virginia, and especially the city of Richmond, has a deep interest. Measures should be taken to have a large canal cut on one or both banks of the river, that would command the whole fall, and distribute the water in the most advantageous and desirable manner, to at least fifty large manufacturing establishments of various kinds. The canal should have a cross section at the water line of not less than one hundred feet, seventy feet at bottom, and ten feet depth of water. If this important work should not be completed at an early date, it is probable, indeed, certain, that in a few years such will be the number of small and conflicting establishments, that no general and comprehensive plan can be executed, by which the immense water power you possess can be made available. If you had such a canal as I have already indicated, and water power and sites were open to any one that saw proper to purchase and improve them, you may be assured that it would not be long before Richmond would have a manufacturing population not far short of her present number of inhabitants."

[It is indeed both surprising and lamentable that the prodigious water power of Richmond has not been more used for manufactures, and that the applications (except for flour mills,) which have been made of it, have not been more successful. If the scheme of the writer of the above remarks, was *properly* carried into effect, by a large canal through Manchester, that now decayed and dilapidated village might yet overtake her flourishing neighbor, Richmond, while giving to her new sources of vigor and growth. But a master mind is necessary to give impulse, direction, and success, to such a magnificent design. The remarkable success of Petersburg in cotton manufactures, with her very inferior advantages, compared to Richmond, is owing principally to the genius and energy of one individual, seconded by the confidence which he has inspired, the spirit, and the enterprise of his townsmen. Dr. John Y. Stockdell, as the projector and director of the most valuable of these establishments, has been a benefactor not only to Petersburg, but to Virginia and all the South: and if his or similar abilities were called into action to plan and direct a general system for employing the far greater manufacturing power of Richmond, the results might be expected to be increased in value in proportion to the far greater means that could be brought into operation.]—ED. FARM. REG.

From the Cincinnati Gazette.

INCREASE OF TRAVEL AND TRADE ON RAILWAYS.

Before the Charleston and Hamburg Rail Road was made, the travel between those places was by stages, three times a week, and averaging about four passengers each trip. Now, by rail road, an average of fifty per day, making a difference of more than twenty-three hundred per cent!

The travel between Baltimore and Washington has increased, since the rail road, from less than fifty, to two hundred and fifty per day, or upwards of four hundred per cent. The estimate is, when this road is completed to the Ohio, it will average at least one hundred and fifty passengers per day, each way; this will be found to be a very low estimate. On the main stem of the Baltimore and Ohio Road, so far as made, the travel this year is double what it was the last, and the freight has increased fifty per cent. in the same period.

On the Pennsylvania Rail Road and Canal, the amount of tonnage that passed *over the mountains*, westward, between April 30, 1835, and May 11, 1836, a period of twelve months and nineteen days, was over twenty four millions of pounds; during the same period the transportation east was ten millions of pounds, making an aggregate of seventeen thousand tons; in addition to this, more than one hundred and fifty thousand passengers crossed the mountains, exceeding three hundred per day, and three times the number that passed the preceding year.

On the Liverpool and Manchester Rail Road the travel has increased, from what it was before the road was made, from an average of less than one hundred per day, to the astonishing number of five hundred thousand in the last year, making an average of near 1,400 per day.

It is from facts like these that we must estimate the profits of our great enterprise. At the lowest possible estimate, there will not be less than one hundred passengers per day, each way, the first year, which, at five cents per mile, will be thirty one dollars for each passenger, or six thousand two hundred dollars per day, forming an aggregate of two millions two hundred and sixty three dollars per year. Allow half this amount for way passengers, and you have an aggregate of three millions, three hundred and ninety four thousand five hundred dollars, for passage money only, making upwards of thirty per cent on the whole capital invested, which may be taken for clear profit, as the freights will far more than pay every expense.

Pitkin gives the number of miles of rail road now in operation at sixteen hundred, and the cost at thirty millions of dollars. The number of miles of canal now in operation is two thousand eight hundred and sixty seven, at a cost of sixty four millions, five hundred and seventy three thousand and ninety nine dollars.

From the Journal of Commerce.

THE PROGRESS OF STEAM.

From the extent of our coast, the number of our navigable rivers and lakes, and the "go-ahead" character of our population, it is evident that steamboats have a special adaptation to our wants; and as a matter of fact, we are, in this species of navigation, quite in advance of any other nation on the globe. Not only are our steamboats, as a general remark, larger and more elegant, but their aggregate tonnage is greater. Its increase, for some years past, has been surprisingly rapid. In 1829 the whole steamboat tonnage of the United States was only 39,419 tons. At the end of 1834, beyond which the returns do not reach, it had increased to 122,274 tons, and is now doubtless at least 150,000 tons. This, at an average of 300 tons to each boat, would give a total of *five hundred steamboats*. Their speed has increased almost as rapidly as their number. If we suppose each boat to carry on an average 100 passengers, the aggregate number would be 50,000. About this number we presume, are constantly afloat in these moving palaces. In the vicinity of navigable waters, they supply, to a great extent, the place formerly occupied by stages, private vehicles, and even *legs*. It may literally be said that where steamboat navigation is available, no man can afford to go on foot. The speed of the boats has increased almost as rapidly as their number. Fifteen or sixteen miles an hour is now considered nothing extraordinary. Places which 25 years since were considered far distant, are brought so near together by this wonderful invention, that they are almost parts of the same town. The revolutions which it has effected in business and property are very great. By the facility which it gives in the transportation of troops, ordnance, and supplies, it adds immensely to a nation's defensive power; and not less perhaps, by the means it affords, of annoyance to a blockading squadron. It will in fact revolutionize the system of naval warfare. If the progress of steam is to continue in the ratio of the past ten years, it will require a forest per day to supply the consumption of fuel. In short, we see not but the expense of wood and the difficulty of obtaining it, would ultimately become so great as to diminish essentially the value of the invention. But fortunately, in this dilemma, we have another resource which is inexhaustible; the mountains of anthracite coal with which our country abounds. In a few of our boats this article is already used with success, and from its power of producing heat, we have no doubt it will ere long be preferred to wood. If there are any inconveniences or drawbacks attending its use, the inventive genius of our people will find a way to remove them. Much has already been accomplished in this respect (chiefly by Dr. Nott,) and the rest will be achieved in due time.

For the Farmers' Register.

WHICH IS THE BEST ROUTE FOR A RAILWAY TO THE SOUTH-WEST?

No. II.

The Charlotte Convention have considered and rejected the plan of a western railway south of the Appomattox, as advocated in the last number of the Farmers' Register; and have approved, and recommended the construction of railways from Danville to Farmville—from Richmond to Farmville—from Lynchburg to Farmville—and from Petersburg to Farmville.

The delegates present, when these decisions were made, were 35 in number, of whom all but 10 were from the counties of Charlotte and Prince Edward. Of the other 10, 2 were from Richmond, 1 from Amelia, and 7 from Nottoway. The votes were taken individually, and therefore it is not at all strange that the plan of the railway route from Danville to Richmond, passing centrally through both Charlotte and Prince Edward, should have been preferred, by a majority of the convention, to that of a railway for more general objects, from Richmond through Petersburg, and stretching westward along the great ridge south of the Appomattox. It is my present purpose to consider the plan last named, in the new aspect in which it is placed by the recommendation of the *intersecting route* from Danville, through Farmville to Richmond—supposing that recommendation to be effectual, and the railway, as recommended, to be constructed.

To have the clearest view of results, let us suppose both these great railways finished, and (as certainly will be, as soon as either,) the western termination of the southern ridge route extended far towards, and perhaps into Tennessee. *The point of intersection* of the two roads would necessarily be on the dividing ridge, between Charlotte and Prince Edward, and between the head springs of Bush and Buffaloe Rivers. On the diverging ridge between these rivers would be the only very good route to Farmville. The point of intersection would be necessarily determined by the meeting of these two ridges, and could scarcely vary half a mile from the spot which I assume—which is 29 miles from Nottoway Court House, 20 miles from Farmville, and near the main road from that town to Charlotte Court House. Richmond would be the eastern termination of both routes—and the western ends of both would be undetermined—both being expected to be continued, in distant lines, far towards the south-west.

From this *point of intersection* to Petersburg, by Nottoway Court House and Cocke's Road, according to long established computation, the distance is 74 miles; and continued to Richmond 20 miles farther, would be 94 miles.

From the same point of intersection, by the ordinary computation, to Farmville, the distance is 20 miles—and thence to Richmond by the mail stage route, (agreeing nearly with, and being fully as direct as the ridge between James and Appomattox rivers,) the distance is 76 miles, or 96 in all. Thus by the present nearest and best roads, and by computed distances, Richmond is two miles nearer by way of Petersburg, than by way of Farmville.

Again—suppose the rail road from City Point to Petersburg (for which subscriptions are now in the course of being received,) to be constructed, (say 11 miles,) and united with the great northern, southern, and western lines which will all meet in Petersburg: then from the *point of intersection* to City Point, would be 105 miles—and 107 if reached by the lower Appomattox—and by Farmville, Richmond, and James River to City Point, the distance would be 146 miles.

Thus, from the common point of intersection, by the southern route, and through Petersburg, Richmond is nearer by 2 miles, and City Point by 39 miles. If, instead of at City Point, the railway connexion with James River is made at Coggin's Point, (15 miles from Petersburg,) and the northern ridge route continued by railway from Richmond to Westover (26 miles by the present road,) the comparison would be somewhat varied in favor of the latter. Still the distance from the point of intersection through Petersburg to Coggin's Point (at deep ship navigation,) would be but 109 miles, while through Farmville and Richmond to Westover, just opposite, would be 122.

For these distances, I have thought it preferable, and nearest the truth, to take the existing roads, and their computed distances, rather than straight lines on the map, and any supposed deviation which railway routes might make from either of the existing roads, whether to seek shorter, or more level courses. It may be presumed that the two routes compare fairly in these respects—and that it is as probable that one would gain as the other, in the changes made for proper railway routes.

Let us now compare the northern and southern routes, (between Richmond and the *point of intersection*,) together with their probable business in conveying travellers and commodities.

It is admitted by all, that railways cannot compete in cheapness with moderately good navigation, whether on canals or rivers, for conveying the agricultural products of a country, or any heavy commodities, not of great value compared to bulk and weight. Therefore it follows that a railway route which crosses navigable rivers, flowing by good markets, or which passes parallel and near to the course of a river, cannot be expected to receive any such commodities, when near to navigable water—nor even at a distance, except for carriage to the first place of deposite for the cheaper water transportation. While the navigation of the Roanoke and its two great branches remains as imperfect as at present, the Danville railway, which will cross both the branches, may be expected to bring to market the produce of that rich surrounding country—but it will not be so conveyed farther than to be embarked on the Appomattox, at Farmville. It is not necessary to repeat the reasons stated in my former piece, to prove that for all the remaining distance, of 76 miles to Richmond, that either the Appomattox, Willis', or James River, will be sufficiently convenient, and a much cheaper carrier of agricultural products. The same circumstances and reasoning will also show that no bulky or cheap merchandize will be brought from Richmond by the railway, for such distances as either of these rivers will serve for the transportation. Light and very costly commodities only, or others in case of rare emergency, or in temporary interruptions of navigation, will constitute all the freight that can ever be expected for the railway, in either direction, between Richmond and Farmville.

Between Staunton River and Farmville (about 40 to 45 miles,) and especially while, as now, the Staunton is scarcely used for navigation, this road will take much freight: and this section of the Danville Railway, will be the more profitable, because it also may be constructed on a continuous ridge, without crossing a stream, or a ravine.

The *southern ridge route* would convey country produce, and from a very extensive region, from the point of intersection to Petersburg—and a large portion of that produce as far as Richmond, or to James River. It is true that both the latter extensions would belong to other companies: but they will be but different terminations of the same great route, and it is proper to view the trade and travel of all the parts, in connexion. Confining the view, for the present, to the part of the route east of the point of intersection, it will be evident that it offers the cheapest and best conveyance to market for all the products of the counties of Nottoway and Lunenburg, the greater part of Dinwiddie, and smaller parts of Brunswick, Mecklenburg, and even of Charlotte and Prince Edward—and without there being any danger of rivalship from any other future improvement elsewhere. In addition, some part of the freight from the Danville road may be expected to diverge to Petersburg, or to James River, and thus increase the profits of Petersburg and of the southern route, at the expense of Farmville and the northern railway. I readily admit that when this western railway shall be continued through Campbell, that the products received above Lynchburg and Farmville, will diverge to one of these towns, and thus balance the advantage to the eastern section above mentioned. The country products collected above Lynchburg, and as far as Tennessee, would all leave the railway for Lynchburg, and the cheap water conveyance on James River. And this would be an immense and new gain of trade to Lynchburg, and to the canal—as without the facility of railway transportation, not the hundredth part of the amount of heavy produce could be brought from the south-west of Virginia, and from Tennessee.

So much for the comparative business of the two routes in conveying commodities: now let us compare the inducements to travellers.

There is already a great amount of travel in the route from Danville by Charlotte Court House, which is divided between the road to Richmond, and more northern destinations; and the number of travellers would doubtless be tripled, or quadrupled, by giving to this long route the speed and facilities of railway conveyance. The local travel along the same route, and most of which would be directed to Richmond, would also be very great—and, as on other railways, would probably exceed any previous estimates that would be considered reasonable. The share of this travel which would pass by Farmville to Richmond, and the share which would diverge to that direction from the western extension (by New London,) of the southern route, would constitute nearly the whole business of the railway from Farmville, besides its own local travel.

Now what would be the inducements to travellers coming by either of the western routes, to choose the eastern end, *north* of the Appomattox, rather than that *south* of the Appomattox? Even to all who were seeking Richmond alone, the southern route would be a little nearer, and therefore the choice of the latter would be at least as likely to occur; and to all strangers, the passage through Petersburg would offer some additional cause to prefer that route. All who wished to go to James River, or to take the steamboat for Norfolk, or for any northern or southern city, would also find the southern the nearest route. Those who have business in Petersburg, of course will take this direction. On the other hand, business in Farmville, or elsewhere in that direction, would be the only inducement to choose the northern route. For these reasons, it seems more than probable that *at least three-fourths of all the distant travel*, would be continued by the southern route, either to or through Petersburg.

The comparison of country products and other commodities, carried, would show a far greater preponderance in favor of the southern route. The service rendered to the public by the two roads, will be measured by the amount of produce carried to market, rather than the amount of distant travel: and if estimated by that rule, the southern route will be found highly beneficial and profitable to a large part of Virginia which is now almost deprived of market by its location—while the northern is not wanted, and would be used, but to a very small extent, for any such purpose.

Next let the facilities for construction be compared.

In the first place, let it be borne in mind, that 24 miles of the southern route, from Richmond to about three miles south of Petersburg, will have been constructed by other companies, and for other profitable objects, before any other part of the great western railway will be ready for use. In this 24 miles, will be embraced all the very difficult and expensive ground, steep inclinations, and bridges, that will be necessary in the whole route. Then the length of railway, on the southern route, requiring to be constructed by a new company, is short of the distance from Richmond to the point of intersection with the Danville railway by 24 miles—and of course rather more than 24 miles less than the actual length of construction required for this single object, on the route north of the Appomattox.

From the point of intersection of the proposed western, with the Danville railway, to Petersburg, and from the same point to Richmond by Farmville, both routes are on ridges, except where the latter crosses the Appomattox, and perhaps for some miles next to Richmond: and with these exceptions, it may be admitted that both routes are equally suitable for railway constructions, and mile for mile, would be equally cheap.

Next as to the comparative ability, and willingness, to pay for the construction of the two rail-ways.

This question has been already, though indirectly, discussed and sufficiently settled, when comparing the probable business and receipts, and probable cost of the two railways. The country which the adoption of the southern route would place near to market, together with the town of Petersburg, can easily and profitably pay for this road, without aid from foreign capitalists, from the surplus fund, or from the legislature in any way, except in the granting a charter of incorporation, which there can be neither reason nor pretext for denying. It is left for others to judge whether the small interest that *exclusively* demands a road on the northern route, can afford to pay the cost of its construction; and if not, whether from the treasury of the commonwealth the deficient amount can be expected, or ought, in justice and propriety, to be supplied. It is certainly not the *great Richmond interest proper* (—an interest which is, and ought to be, specially guarded, as next in importance to the general interest of Virginia—) which demands the use of the *northern*, in preference to the *southern* route. That a railway from the south-west to Richmond is most desirable—*nay, indispensable*—will be admitted by all. But Richmond, however deeply interested in obtaining this great improvement, will not *pay the cost* of an unprofitable mode of obtaining it, when one equally serviceable, and highly profitable, is available—and to which the sole objection (and an objection which commercial jealousy alone can entertain,) is, that the route would pass through the smaller town and worse market (as it is said to be) of Petersburg: and if Richmond will not pay for a work which will subserve her interests *exclusively*, no considerable aid can be expected from any other source. If Richmond will, in every way, profit by the great South-west Railway, (or "James River and Tennessee Railway," as it may hereafter be truly named,) let her join, and take her proper share, and exert her proper influence, in the scheme which promises most profit, and best to serve the general interest—and not oppose what will incalculably promote the prosperity of Richmond, *because* it will also benefit what mercantile jealousy considers to be a dangerous rival.

It is scarcely necessary to add that the change of circumstances which the Danville road (if constructed) will present, promises to make the southern ridge route even more profitable than it otherwise would be. Its first great section, to the Danville road, will, by that road, be brought into earlier and more productive use—and the work may there pause until it is deemed advisable to stretch farther westward, to join the road from Tennessee to Lynchburg. The benefit to be expected from this connexion with Danville, will more than counterbalance any diminution of profit caused by the extension of the road from Farmville to Richmond—admitting that extension to be certain to be made.

My first article on this subject, though received by the public with far more notice and respect than I had expected, nevertheless was considered by each town as hostile to its interest, and as favoring what its jealousy deemed the adverse interest of some other. Such opinions were at least expressed in the papers of Richmond and Lynchburg, and were entertained in Farmville. I have seen a letter from one of the most considerable and intelligent capitalists of that spirited and thriving little town, in which, commenting on the argument of R. N., he says that he considers the writer's "*aim is to aggrandize Richmond at the expense of the other towns*—." The number and purport of these conflicting charges, serve to clear the writer from all; and, with unprejudiced and impartial minds, may perhaps give him the credit he claims, of laboring to serve no one separate and exclusive interest, at the expense of the general welfare—and he believes, that the adoption of his views would benefit every town on and near the line of improvement, though in unequal proportions; and certainly would injure none. The foregoing remarks on Richmond and her proposed northern route, though strictly in accordance with the views formerly presented, will probably, by some readers, be considered as indicating hostility to the interests of that city. This construction, the writer can only protest against as altogether unfounded, though he is willing to avow enmity to all narrow minded commercial jealousies, whether entertained by Richmond, Lynchburg, Farmville, or Petersburg. To the last named town, it may be considered that these views are particularly, if not exclusively, favorable. Nevertheless, an essential feature of the general scheme would be now considered by most inhabitants of that town, if adopted, as operating to remove her trade and her wealth to Richmond, or elsewhere, and absolutely destructive to her prosperity. This feature is the perfect *freedom of passage* through Petersburg, by connecting all the different railways, and thus permitting all who may desire it, to seek other markets, with the least possible delay, trouble, and expense, incurred in passing through Petersburg. Of course similar measures would be approved in Richmond and every other town: but at present the question will be considered only as it regards Petersburg.

It is an evident consequence of the positions which have been contended for, that the promised public advantages could not be even partially obtained, without the freedom of passage to trade and to travel; nor could Petersburg expect the entrance of this immense and new accession of travellers and commodities, if she opposed the slightest obstacle to the departure of either, when circumstances made such departure desirable. A close or perfect monopoly, though always injurious to the public, may be a very good thing to those who enjoy the benefit of its restrictions and impositions on others; but the *attempt* to impose such restrictions, without the power to make them effectual, serves only to produce irritation and enmity in the class whom the measure injures—and resistance and defeat to the attempt. If a town opposes difficulties to the passage of commodities to another, it amounts to an admission that she offers a worse market than her neighbor: and whether such is a fact or not, those persons whose commodities are designed to be stopped, will act upon the admission, and determine to surmount all obstacles, and proceed to what they will consider the better market. The prevalence of an opinion, even if it be false, that a particular town is a better market, tends to make the opinion true, by giving to it increase of trade, and thereby drawing to it accessions of capital and population, all of which produce competition, and at the same time enable the competing merchants, by increase of business, to buy at dearer, and sell at cheaper rates, than a smaller trade would afford. There are plenty of existing difficulties in the passage from the Appomattox basin through Petersburg to deep tide water—and yet in spite of these obstructions, more than half of the tobacco brought down the canal is sent through that town down the Appomattox, and up James River to Richmond--whence it is to return down James River, to reach foreign markets. Now suppose it were possible to remove every such existing obstacle, both natural and artificial; would that change cause a greater loss of trade? On the contrary, it would greatly increase the whole amount of tobacco brought to Petersburg, from the southern counties that now carefully avoid it; and though the quantity sent away would be greater (at least at first,) so would be the quantity that would find there a market.

So of commodities received by the southern and western railways. The perfect ease, and small additional cost, of sending them on to other markets, would remove all objection to bringing them first to Petersburg; and of the new and great supply thus sent, even though *all* of it might be designed to be sent farther, a portion would certainly remain—and that portion would increase, as circumstances served to increase the general business of Petersburg, and of course its value as a market both for purchases and sales.

With regard to travellers by railways, it is still more absurd to oppose difficulties to the transit, which to make, was their sole object in coming, and which no one expects to prevent. But still it is the policy of every town to oppose a *little* obstruction, in delay, trouble and vexation, more than of actual expense, to every traveller who comes on one railway to pass away upon another. "Compel every traveller to leave a little money in the town, if it is only a quarter of a dollar to a porter for carrying his trunk." Such was the jocular remark which I heard from a merchant of wide and liberal views in general; and it accords well with the general opinion as to prohibiting the junction of different railways, or other lines of travel and trade. A traveller, anxious to hasten onward, will scarcely pay less, in detention, trouble and money, than a dollar, in passing from the Petersburg and Roanoke, to the Richmond and Petersburg Railway, even though they may approach within half a mile. This tax is his loss, while scarcely the eighth of it is the clear gain of the porter, and still less that of the town. The effect is precisely such as adding a dollar (perhaps more) to the railway fare, and to that extent operates as a discouragement to the use of the line of travel, and an inducement to prefer any rival line that is as cheap in direct expense, if not accompanied by such *indirect* taxes.

Suppose that the law had given to the town of Petersburg authority to impose a direct tax of fifty cents on every traveller who passed through by railways, and as much on every bale of cotton or hogshead of tobacco that passed by the same conveyances to Richmond: Would it be good policy to exercise this right of taxation? Every man would pronounce the imposition to be as impolitic as illiberal, and tending to drive both trade and travel from the town, and to injure the railway, the construction of which has added so much to the wealth and to the character of Petersburg. Yet though such a tax in money, which would at least be so much gain to the town treasury, would be rejected, a tax equally heavy is indirectly levied, with general approval, and of which nearly the whole amount is lost to every body. As a prohibition on departure, it is altogether inoperative: for no farmer will be deterred by such a small obstacle, if he is desirous of conveying his crop to what he is taught to believe a better market. These may be small matters—but they involve important and widely operating general principles.

If then the entire plan of improvement which I advocate was executed, and the Danville road brought across it, whether to stop at Farmville, or to continue to Richmond, I conceive that the advantages to the several towns would be divided somewhat in the following manner.

To Lynchburg would pass, (by the branch railway before proposed,) either to be there sold or to proceed down James River to Richmond, all the produce brought from the west by the railway, and its future extensions towards and through Tennessee. The rich supplying back country which Lynchburg now has in the counties of Patrick, Henry, Franklin, and part of Pittsylvania, could not possibly be attracted from the present market by the great western railway—and would in some measure be aided by it in getting to Lynchburg. The Danville road could certainly take part of this produce—(and so will the Roanoke when properly improved—) but whatever injury Lynchburg may ultimately sustain in this manner, will in no degree be increased by the great western railway passing in her rear. It is absurd to suppose that country produce and returning merchandize would prefer railway to canal or river carriage—and such preference only, could cause Lynchburg to lose any trade by the plan proposed. Of course, in this as in other cases, the direction of trade will depend much on the reputation of the towns as markets. A portion of this rich country around and near Danville, when all these improvements are made, may choose as a market either Danville, Clarksville, Norfolk, Lynchburg, Farmville, Petersburg, or Richmond—the access to all these being more or less facilitated.

Farmville would receive all her present trade, and a great addition, by the new facilities opened by the western road into Campbell county—and still more by the new trade brought by the Danville railway. Farmville reached by the branch railway, would be 54 miles nearer than Petersburg—which advantage would surely suffice to enable Farmville to retain all her present back country that might use the Danville road.

Petersburg would receive, purchase, and ship on James River, all the great supplies brought to that town, of grain, cotton, and all other commodities except tobacco; and of the latter crop, even if (as now) the greater part should pass to Richmond, in search of better prices, the passage through would still enable Petersburg to retain it whenever circumstances may permit—or to give it a cheaper passage seaward, by facilitating her shorter and more convenient outlet by railway to James River. The mere knowledge of the existence of such easy access to the best ship navigation, would add much to the reputation of Petersburg as a place of export trade; and together with the equally free extension of the rail roads through the town to Richmond, would tend powerfully to invite, by this liberal arrangement, even more trade than both the great western and southern railways, if they could be compelled by the spirit of monopoly to terminate there. The trade of Petersburg, as now limited, is offered greater increase from the adoption of the whole scheme, than that of any other town—but only upon the condition that the passage of commodities shall be made as free as possible to and from each of the six inlets and outlets by railways, canal and river, that would there centre. However reluctantly, commercial jealousy and narrow minded cupidity *must* yield to this desired freedom of passage. It is fortunate for the welfare of Petersburg that she cannot refuse to other markets the main benefits of this free passage, even if desirous to refuse. If free passage through the town is denied, it is perfectly easy for the southern, western and northern railways to unite with the Appomattox canal above the comporation limits, and for the western railway in like manner to be continued, and on the same ridge too, to James River. Petersburg will have to choose between the immense benefit of all these lines of trade, meeting at a common centre within her limits—and the loss that would be caused by their passing by, to other destinations.

The share of Richmond of the increase of trade brought by these improvements, would be nearly all the products from the remote south-west that would be emptied into the river route at Lynchburg, and all that would be attracted through Petersburg—together with supplying in exchange or return all the foreign merchandize required for the same, or even a more extensive back country.

The distant travel would be divided principally between Richmond and Petersburg, much the larger part however seeking Richmond. Though the profit of carrying travellers is of immense importance to railway companies, their passage through any town is of very little advantage to it, unless they stop for purposes of trade. Therefore, though the adoption of the southern ridge route would keep from Lynchburg and Farmville all the travel not destined for those towns, they would lose nothing by it worth consideration. If the main line, in spite of local obstacles, was made to pass directly through these towns, the long travel would yield to them no benefit, if permitted a free passage—and if taxed by detention, would only give a little profit to tavern-keepers, hack-drivers, and porters. The commodities for which these towns would be the best or most convenient markets, would seek them as certainly by the branches, as the main railway route, if that was changed so as to pass directly through both.

If the railway from Farmville to Richmond should be made, in addition to the other lines, it will not affect the distribution of trade, nor materially that of travel. But by dividing the travel to Richmond between two railways, that one could as well convey, the receipts and profits of both would be diminished—to the great loss, certainly, of the southern line, and to the absolute ruin of the northern, the income of that being from travel almost exclusively.

It is unnecessary to add to these observations, by considering the two other railways recommended by the Convention of Charlotte—because neither is demanded by any interest considerable enough to make the construction probable. The one from Farmville to Petersburg, besides being far more expensive to construct, and to use, owing to the more hilly location, would be so much nearer the Appomattox that it would accommodate a smaller producing country, and of course take less trade, and yield less profit, then the route proposed on the ridge, with the branch to Farmville which either scheme offers: and Farmville can suffer no loss or inconvenience by the preference of the ridge route, except the adding 20 miles to the small amount of travel passing direct between that town and Petersburg. No commodities, except in rare cases, would pass the whole distance by either route, because the Appomattox navigation when improved and facilitated, will be far cheaper than either. As to the railway from Farmville to Lynchburg, as an extension of the northern ridge route from Richmond, it will never be executed in the manner recommended by the convention. If, constructed at all, it will be in furtherance of the interests of Richmond rather than those of Farmville—and therefore, (as well as for a better location,) will be made on the *north* instead of the *south* side of the Appomattox. The choice between the southern and northern ridge routes, east of Farmville, for the great western railway, or the greater success of either, if both are used, will determine which will be the proper route to be continued to the south-west by Lynchburg. If the best is chosen for yielding profit on the stock, and for general accommodation and use, I doubt not that it will be south of the Appomattox—and whatever may be its particular location, it will suit the convenience and interest of Farmville better than any she can obtain by leaguing with Richmond. If able to get the road to Lynchburg, at all, Richmond, will certainly be enabled to prescribe the the route: and no interest, public or separate, save that of Farmville, could require a railway, brought from Richmond through Cumberland, to diverge to the south of the Appomattox, to reach Lynchburg. A branch from the nothern ridge route (as proposed in the Convention by the Richmond Delegation,) will be all that Farmville can obtain. In this alliance of Farmville with Richmond, the latter town can, and will, take the "lion's share" of the spoil.

R. N.

September 11th, 1836.

For the Farmers' Register.

ROUGH NOTES UPON SOME OF THE AGRICULTURAL IMPROVEMENTS OF CHARLOTTE, AND THE ADJACENT COUNTIES.

Charlotte Court House, Sept. 6th, 1636.

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A most important system of improvement, both for private and public interests, is in the course of execution in this part of the country. This is the supplying water-power to mills by means of canals, instead of the ponds which (as elsewhere in lower Virginia,) have long served that purpose. One result of this charge is the laying dry, and cultivating the lands heretofore covered by these ponds. A large proportion of the mill ponds in Charlotte have already been thus laid dry, and in every case, the canal has furnished a better and more permanent water-power. For the comparatively trivial expense of cutting a side canal, on a level, leading from the head of the pond to the water wheel, there has been gained for cultivation, in every case, a body of greater or less extent of very rich soil; and a relief from the always impending dangers, and enormous losses, of broken dams, from floods. But the greatest benefit which may be expected from the general adoption of this plan, is the removal of the greatest cause of sickness which has ever afflicted lower and middle Virginia. I have long been of the opinion that the diseases and deaths produced by the mill ponds of this country were evils so great, that they were not compensated by all the profits and conveniences of grinding meal by these means: and that even if we had to resort to horse or hand-mills, to obtain meal, that it would be a great public benefit if the dam of every *pond-mill* in the country was thrown down, and, no new ones permitted to be constructed. But luckily, there is no such loss to be encountered by millers, nor any inconvenience caused to their customers. Though some mill ponds still remain in Charlotte, to poison the air and people, I was told that there was not a doubt left of healthiness having been already greatly promoted by the drainings which had been made. Still the improvement has been very slow in extending—and it is owing to the *fortunate* occurrence of some tremendous floods that have swept away dams that were deemed the most secure, that many have been induced to accept the benefit of canals. I found John P. Dupuy esq: in Nottoway, engaged in constructing a canal to his mill, in consequence of one of these fortunate calamities—and there heard of another having been successfully constructed in his neighborhood. One, still earlier made, and which was described at p. 579 vol. II. Farmers' Register, has been tested by time, and found to answer entirely the expectations of its owner.

One of these ponds on Wardsfork, (and there were formerly 4 other mill ponds on that stream, within the length of 8 miles, of which two still remain,) belonging to Henry A. Watkins esq. covered 100 acres of land so valuable that he was offered by an adjoining proprietor, and refused, \$200 per acre for a part of it, after its being drained. From 15 acres of the same, he once sold as much good tobacco as amounted to \$1500, exclusive of the "cullings." If it was possible to estimate the amount of the suffering and loss, in deaths, sickness, and the consequent hereditary feebleness of constitution, of the generations that lived near this, any other large and shallow pond, it would present an awful exhibition of the carelessness with which we throw away the health and lives of many, for the *erroneously* supposed gain of a few. Yet the mill ponds of Charlotte were trifling evils compared to those which are so thickly scattered throughout the lower and more level country. Very few here are one third of the size of the one above mentioned. In the lower counties, very many are much larger. The pond of Tabb's Mill in Dinwiddie, now drained and cultivated, formerly covered 1200 acres: and several in Prince George and Surry cover from 300, to upwards of 400 acres each. In addition, these very large ponds are worth but little as water power—and in the opinion of even the owners, must do much more harm than good. But the little benefit of each pond goes to one person, and the sickness is generally divided among his family and many others. The land forming the bottom of the pond also generally does not belong to him who has the legal right to keep it worthless by its being covered by water; and therefore *he* has no interest in laying land dry, that would revert to the possession of others. This is one of the most stupid and worst parts of our legal policy.

The Wardsfork lands are the slopes and hillsides which lie adjacent, and descend towards that stream. There is very little extent of lowground on that stream—and the good land and good farming of Wardsfork, both of which are deservedly celebrated, are to be found on this generally steep and broken surface. The soil is mostly of red clay loam of moderate tenacity, and though of paler color, and of inferior quality, these lands are much like those of the South West Mountains. The surface of the Wardsfork lands is even more steep and broken. The soil was originally fertile, and when greatly impoverished and galled, as nearly the whole body has been, may be brought back to a productive state by means comparatively easy. Gypsum on clover greatly aids this particular course of improvement, and is very beneficial on all these lands, on corn and tobacco, but (as elsewhere) especially on clover. The dearness of this manure, caused by its long transportation, offers at present the greatest obstacle to the profitable improvement of the lands.

The distance from market, and the great expense of transportation, causes tobacco, here as in all the adjacent country, to be the almost sole crop for sale. This culture, requiring the richest land, is not thrown in the same rotation with corn, which is made on the poorer parts of every farm. The rotation of the tobacco land, usual on the best managed farms, is, 1. Tobacco, 2. Wheat, 3. and 4. Clover not grazed, or mowed—or, at most, but to a small extent. The other is 1. Clover, 2. Oats, 3 and 4. Clover. Sometimes there is one year less of clover, thus making either of the above a three, instead of a four-shift rotation. Mr. Watkins, who has had four shifts both for his tobacco and corn rotations, is going to have only three for the corn, in future, as he thinks that giving the benefit of gypsum *regularly*, will amply compensate for reducing the *manuring by clover* to half the amount, heretofore given on his highly improved and well cultivated farm. He has proved by long experience, (in one field as long as 30 years,) that by using gypsum on clover every year, and leaving all the clover to improve the land, that it will continue to get richer under the above four-shift rotation, without any other manure whatever. His tobacco on the piece so treated for 30 years is always the best of his generally very fine crops: and the present grade of productiveness of this piece, he is certain, is above that with which the soil was originally endowed by nature, and which had been greatly reduced by cultivation, before his course of treatment was begun. He has also found this very important result—that the gypsum, though repeated so often, and for so many years, has not ceased to be operative; nor is it known, that its later effects are lessened. I hope that the details of this very interesting part of Mr. Watkins' management will be given by him for publication, and therefore I will say no more.

The practice of suckering corn has been abandoned for two years by both Mr. Thomas E. Watkins and by Mr. Richard I. Gaines, upon the grounds presented in a communication to the Farmers' Register, at p. 685 vol. 1. Both of these gentlemen are perfectly satisfied that they gain both in grain and forage by omitting this usual and troublesome part of corn culture. Mr. Watkins thinks that not more than one-fifth of all his suckers fail to produce ears; and the ears which they bring are generally perfect in form, and similar to those on the main stalks. I had supposed that they would be mostly produced on the tops, and be such imperfect ears as late suckers (left by neglect) often show.

I saw a piece of low-ground (on Ward's Fork) belonging to, and reclaimed by John F. Edmunds in so perfect a manner, that it was admitted to be by the gentleman who pointed it out, the most productive land known. But the crop of corn now on it is very much below what the soil is capable of producing, owing to the unprecedented floods which have this year damaged that, and ruined the crops of other low-lands less judiciously managed and secured.

With all my confidence in the several gentlemen with whom I conversed, it would have been difficult to believe that nearly all the lands on Ward's Fork, including the richest, (except J. F. Edmunds' farm, which he cleared himself, and has never lost its virgin fertility,) was at some former time, not only worn to poverty, but so washed as to exhibit numerous galls every where. It is difficult to imagine such a state of things, where the aspect is now so different. But I saw some land the culture of which had continued to be as careless and exhausting as *all* had been formerly, and of which the soil and surface were similar to the best lands; and here the poverty, and array of galls, were fully equal to any thing I had heard of on the other lands, and such as I would have expected in my own poorer country, wherever the surface is much broken, and the farming bad.

The removing the worms from the growing tobacco is a very troublesome job, and to which there is no end so long as the plant continues to grow. The fly lays eggs by thousands, which hatch speedily, and the worms begin to devour the leaves as soon as they escape from the shell, and when so small as to be observed with difficulty. Of course their destruction requires continual attention, and the handling and examination of every leaf in the field. The parent fly is large, and may be easily killed in numbers, as it is attracted by the stinking flowers of the Jamestown weed, and of gourd vines. If a few only of these baits were permitted to stand on a farm, at one place only, and the tobacco flies were there watched for at twilight, when they come abroad, they might be easily knocked down with paddles by little boys. This is often done, more for amusement than for its use; but not as a regular and general procedure, which alone can make it effectual. Every female fly destroyed, may prevent the having to kill some hundreds, or perhaps some thousands of its progeny. I asked, but could not learn, whether any one had traced the tobacco worm through its middle transformation, so as to know what was its appearance in its dormant state, previous to its taking wing. This might be easily learned by observation: and perhaps it would be found that in that state, it was familiar to our view, but never regarded because not known to be the enemy in question. But as the worm does not make a cocoon on the tobacco plant, and cannot move elsewhere for that purpose, I infer that it buries itself in the earth—and if so, it could not be easily found in numbers.

The high prices of lands, in Charlotte and the adjacent parts of Prince Edward and Nottoway, both of the best and the inferior grades, alone would furnish sufficient proof of the general industry and economy of the people. The best improved Wardsfork farms, 80 to 90 miles from a tide water market, and 30 to 35 from Farmville, their usual place of sale, would sell at $20 the acre. The poorer and generally much worse managed lands seen in passing from Nottoway Court House to Charlotte, vary in price from $12 to 8, few farms being below the latter estimate, unless greatly injured, or originally of the poorest quality. All are hilly, and difficult to cultivate; and yet the prices are nearly or quite double what lands of like quality would sell for within a few miles of tide water.

This part of Virginia has derived, and indeed is still obtaining, immense returns from tobacco culture. But it is questioned by many of those farmers who have had good shares of these rewards, whether this culture is not altogether adverse to, if not incompatable with good and improving farming. It may be readily admitted that such is the fact, when tobacco occupies so large a part of the farm as is usual. But if confined to smaller spaces, I know no reason why tobacco—a *green crop*, and the one which gives the cleanest, and most admirable preparation for wheat—may not form a valuable part of a well arranged, improving, and profitable rotation. The abuse is, that the crops of tobacco receive *all* the manure of every farm, and generally also occupy every spot that still preserves a large share of natural fertility. To give all the manure to a crop which returns none, and to deny to the poorer corn lands at the same time any other sufficient means of improvement, is necessarily a land-starving system, and which, though it may give large present returns, must eventually impoverish those who cultivate the land so treated.

The ridges, and other poorer soils, so far as I could learn, are very little benefited by gypsum, and of course are deprived of that great means for increasing fertility. I could learn of but very few trials on such lands. If I may venture to suggest new practices for the profit of a region to which I am so much a stranger, I would advise the adoption of sheep farms, on a large scale, with permanent, or long continued pastures—and mulberry and silk culture. Both these would suit well on the same land, and both would improve the soil by rest from both the exhaustion and the washing caused by the use of the plough. Sheep farming has never been fairly tried in Virginia, because it cannot be done on a small scale, nor on farms of which every field is frequently and generally in tillage.

————, *Sept. 8th.*

Lime is the manure most wanted for all these poorer natural soils: but with such long and expensive transportation, any considerable use of this manure is scarcely to be hoped for. The better improvement of the Roanoke and the Appomattox, and the construction of railways, may possibly yet place this greatest resource within the farmer's reach: "*provided always*," that the companies owning these improvements may acquire and exercise more common sense than any have yet exhibited, and may discover that the ultimate profits from tolls would be increased, by *encouraging*, instead of *prohibiting*, by the rate of the tax, the transportation and use of permanent manures. Under all the existing discouragements from long and expensive carriage, I heard of two very intelligent, zealous, and successful practical farmers, who have commenced the use of lime to a limited extent, and who are well pleased with the results. One, of whom I only heard indirectly, and whom therefore it might be improper to refer to more particularly, uses stone-lime (from Maine) carried up the Appomattox nearly to the head of navigation, and paying a toll of 25 cents the cask, (three bushels of stone.) This was used in compost; and it was said that the result was at least not discouraging. The other is Dr. A. Campbell, of Nottoway, whose farm is 45 miles from Petersburg, and who draws oyster shells that distance in the wagons which bring his crops to market, whenever they would otherwise return empty. He also has used his lime in compost, and in different modes—and though never at a heavier rate than 25 bushels of shells to the acre, the benefits have been so manifest, and considerable, that he will continue thus to purchase and draw shells, even if at more than double the price of 75 cents the hogshead, (18 bushels,) at which they are sometimes obtained. The other ingredients of the compost, of which the oyster shell lime formed a part, were leaves from oak woods, and earth scraped from around negro quarters, but which did not contain any recent ashes, as those had been previously and carefully saved, and used separately. These scrapings were of but moderate richness, compared to most similar situations where less care had been used to secure and remove the richer accumulations. The compost heap, so formed, was exclusively used to dress one part (I think a third) of the tobacco crop, while the stable manure, and the farm yard manure separately applied, covered the balance of the field. The effects seen on that (the first) crop were greatest from the stable manure, next from the compost, and least from the farm or cattle yard manure. But it should be remembered that the early effects of lime are far from being the best. The compost was also used not long after it had been made; and Puvis says that the longer compost heaps of lime and earth remain before being used, the better the effect as manure. In this application, 25 bushels of shells were used to the acre.

Another mode by which compost was made by Dr. C. presents facts well worth the notice of the chemist, as well as of the farmer. Two casks of stone lime, (about 6 bushels of the stone, before slaking,) late in March, were mixed with the contents of the winter cattle yard, where 35 to 40 head of cattle had been kept, and properly littered with cornstalks, &c. The stalks being generally large, and the quantity great, compared to the treading and animal matter received, they were but little broken. On this account, the whole yard was chopped over with sharp hilling-hoes, by which the stalks were reduced to pieces of not more than 8 inches long. The whole were then heaped, as usual, to be brought by fermentation to a state fit for the tobacco land. The heap was examined at several times, and the heat found to be more moderate than usual: and when cut down for use, at a later period of the spring, the manure was in the most perfect condition—that soft "cheesy" state, which English farmers call "spit dung," from the ease with which a spade cuts into the heap—and there was not a spot fire-fanged, or showing that white mould which is evidence of violent and destructive fermentation.

Now, to mix fresh lime with highly putrescent matter, (as was the animal part of this mass,) seems contrary to all proper deductions from chemical laws. Caustic lime, in sufficient quantity, rapidly decomposes and consumes animal or other very putrescent matter—and fermentation alone, also decomposes it, and injures its value, or lessens its amount. Here both these different decomposing powers were suffered to act together, and the combined effects seem to have been highly beneficial. Can it be that two decomposing powers, acting differently, serve to counteract, and lessen the violence of each other, so that the joint effect of both is less hurtful, or dangerous, than would be the use of either one alone? It should be observed that in this case, the proportion of lime to the whole mass was very small.

The making of *hills* for planting tobacco, which heretofore has been universally considered indispensable, is now abandoned by some planters: in time, this practice, though more tenaciously adhered to, will follow that of hilling corn, which formerly was universal, and deemed absolutely necessary, and which is disappearing wherever reason and experiment are allowed to operate.

It was a matter both of surprise and regret for me to hear, on Wardsfork, that the value of graduated ditches and beds, to prevent the washing by rains on hilly lands, was estimated less highly than formerly, by some of those who used them. But, upon observation of the existing practice, and conversing with several who entertained different opinions concerning the proper modes, and effects, I had no reason to think less highly than before of hill-side ditches, or beds, as described and advocated by several writers in the first volume of the Farmers' Register. The lines for these ditches are often carelessly and incorrectly marked off—and in consequence, may do more harm than good. Besides, none that I saw, even where most effectual and most approved, seemed to me large enough to resist the heaviest floods from falling rain. Another cause of their being considered less important, is, that after the land acquires a good cover of clover, and it has been ploughed under, the soil resists washing so well, that the farmer is tempted to dispense with a practice, which, however serviceable, is certainly attended with much trouble, and requires more skill and care than most overseers can or will exercise. Though there is far less of hilly land in the lower country, yet its sub-soil is of less worth, and therefore more disposed to be washed into gulleys: and for that reason, I think that this improvement is more wanting there, than on the more hilly lands, but better soils of Charlotte. I know, from experience, that horizontal or graduated ploughing, in narrow beds, without the ditches, in the lower country, causes washing to be even more destructive than before.

I am sensible that observations made as hastily, and therefore as imperfectly as these, are in themselves but of little value, even if correct; and perhaps are incorrect, owing to the haste, and peculiar disadvantages under which the writer was compelled to make and note his observations. But if these remarks have ever so little worth, as conveying information *directly*, it is hoped that *indirectly*, they will promote that end far better. It has been my object to draw forth from the individuals whose labors are referred to, as well as others, more full and correct statements on these and other interesting subjects relating to agriculture; and if I have made mistaken and erroneous statements, the corrections can be easily afforded, together with much more of the interesting and instructive matter, which very many farmers of this region can well furnish.

A GLEANER.

For the Farmers' Register.

IMPROVEMENT OF THE APPOMATTOX RIVER.

The Appomattox from Farmville to Petersburg, is but little wider than a first rate canal. It has bold high banks, and a very moderate fall, not exceeding an average of one and a half feet to the mile, from Farmville, to the head of the canal, near Petersburg, a distance by the river of ninety-six miles. The mode of improvement adopted is the lock and dam; the effect of which, when completed, will be to render the bed of the river a perfect canal, with no more lockage than would be necessary in a lateral canal of the same length—and although the navigation of this canal, made of the bed of the river, will be liable to the difficulties arising from the freshets in the stream, yet these disadvantages will be more than counterbalanced by the cheapness and security of the improvements, compared to a lateral canal. Lateral canals are liable to frequent breaches in the numerous embankments, bridges, arches, and tunnels, and filling with mud, settling from the water flowing into the canal, and from the hill sides. The bed of the river is cleared out by the natural process of the strong currents which occur in freshets—and it is easy so to secure the locks and dams as to render them safe against any rise of water. The tow path of a canal will be wanting to this improvement; but steam which is cheaper and better, can be used instead of any other propelling power; and it has been generally considered that steam power would be injurious to canals. The locks are constructing of such a size as to admit of the use of boats of much larger size, than those at present used, and with a view to the use of such steamboats as are now used with great advantage on the Connecticut River, both for passengers, and for towing freight boats. The work is progressing as rapidly as circumstances will permit, and will probably be so far completed in eighteen months as to realize great advantages to the trade of the river, as well as to the farmers who reside in the vicinity of the river, yet who have not heretofore used it, on account of the imperfect state of the navigation. It is calculated that freight will be reduced to half the present rates, as soon as the works are complete. As far as the locks and dams have been completed, the improvement meets the most sanguine expectations, and affords a deep and safe navigation at all seasons. It had been feared by the land holders on the river, that the mode of improvement adopted, wolud prove injurious to the lands; but it has not been found necessara to make any dam so high as to overflow or injure the low grounds, and the experience of near a century has proved that dams across this stream do not cause it to fill with sand or mud; as collections in the bed are swept out by the frequent currents, and deposited on the low grounds bordering the stream. It is believed that the apprehensions of land holders are generally quieted on the subject of injury, and that the improvement is a popular one.

These views and statements are offered to the public—and particularly to those interested—by one whose duty requires him to pay some attention to the subject.

E.

LIMING AND DRAINING.

To the Editor of the Farmers' Register.

Fairfax County, September 6th, 1836.

Your pamphlet upon the use and value of calcareous manures is a public benefaction, in as much as it promises individual wealth. My corn crop, from its use, is far better than I expected, and I am now burning shells for 110 acres of fallow, and if I am not deceived, the difference in the crop will more than pay the expense. Be this however as it may, I shall plough no more land than I can lime. It may be well to remark that no wet land should be limed until *well drained*, for upon this *materially* hangs the result. Much has been said and written upon draining: but one from the dead would not convince ten men in this county so far as to move them to action. All the flat lands or lowgrounds of this county have a tight impervious pan near the surface, which holds the water that falls upon it, and subjects it to regular and perpetual deterioration from the action of frost and sun.

I could name farms all around me upon which the manner of cultivation has been much improved, yet from having neglected to drain their land, not more than one third is now made on it which was made 40 years ago. I blush sir when I say that I believe I have defeated my own purpose in agriculture by seeking to force nature. She will not be forced. Man cannot force her to grow Indian corn and wheat where she has resolved by unchanging law that the bullrush, wild oat, and corn grass shall grow.* Let the cultivator watch the will and purpose of nature: a dry soil, vegetable matter and lime have made 100 bushels of corn to the acre, and I leave it to your readers to say what a wet one has produced.

Have any of your correspondents ever seeded spring wheat—and if so what was the result?

Who has cultivated the same land in corn for ten years and what were the comparative crops? My small drains are so much deranged by the corn crop, that I wish to have my flat lands entirely exempted from the crop.

X. Y. Z.

From the Tenessee Farmer.

THE DIFFERENCE OF EXHAUSTING AND ENRICHING TILLAGE.

Grant me space in your columns to communicate to the public the results of my experience in farming. I have been trying to farm for twenty years, nineteen of which, I persisted in my own course, unaided by agricultural papers, or by any systematic rule; consequently my improvements were small. The last year I subscribed for the Tennessee Farmer, and searched, read and examined it, and other authors—entirely turning my attention to *book farming*: and I freely acknowledged, that the improvements I have made during that period, have far exceeded those of the nineteen previous years; and I return you my sincere thanks for your aid—though I have not acquired all my knowledge from your paper alone, yet I have been materially benefited by it, inasmuch as it begat in me a spirit of enterprise and a desire for improvement. As I have derived great benefit from the knowledge and experience of others, I think it my duty in return to furnish them with the results of my experience, soliciting an enlightened community to pursue an improved and systematic course of agriculture, assuring them, that they will find the profits resulting therefrom amply sufficient to compensate them for their labor and toil. I must, however, confine my remarks to a few only of my experiments.

In the year 1822, I purchased a farm of 354 acres, 125 of which was cleared. The land was once good second-rate land, but was now completely worn out. Being greatly indebted for my farm, the idea of improving the cleared land never entered into my mind; but I set to work opening fresh land, until I had enlarged my cleared land to 225 acres: this I continued to cultivate in corn, until a part of it was so far exhausted, that I could no longer cultivate this crop profitably.

In the spring of 1833, I planted two acres of my land in corn, (this two acres was about equal to the balance of my cleared land) on which I raised 20 bushels to the acre; the corn was worth 25 cents per bushels, amounting to $10; the cost of cultivating was $7, which left me a profit of $3. The following year it remained uncultivated. The next fall I sowed it in wheat. The following spring I hauled out ten tons of good stable manure, which I spread over one acre. At harvest I gathered from the two acres nineteen bushels of good wheat, which brought me the sum of $16,

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* We must express our entire dissent to the doctrine here broadly stated. It certainly is impossible to produce profitably the vegetables which require a dry soil, on land imperfectly drained. But there are not many cases (in this country) in which wet land (not subject to inundation by tide or floods,) may not be perfectly drained: and when that is done, nature readily yields to the new state of things, and will herself, if man does not, eradicate the bullrushes and other products of watery lands, and substitute them by grasses which flourish on dry soils.—Ed.

62½. The cost of the crop, I estimated at $6, 62½. The manure say was worth $10, which brings the account out even. In the spring I sowed orchard grass and clover seed. The succeeding spring I sowed over the grass a quantity of plaster and ashes. The result was—from the manured acre I mowed 5 loads of hay; from the one not manured, I mowed 2 loads; each load was worth at least $5; consequently, the manured acre yielded me $25 worth of hay; the unmanured acre only $10 worth. The cost of harvesting the manured acre was $1 50; plaster, &c., 50 cents, making $2. Profit, 5 loads of hay at $5 per load, $25, leaving a clear profit of $23 on the manured acre. The cost of harvesting the unmanured acre was 75 cents; plaster, &c., 50 cents; making $1 25. Profit, 2 loads of hay, at $5 per load, $10; clear profit on this acre only $8 75. Difference of profit in one year in favor of the manured acre, $14 25.

I have this year made three experiments in my wheat field to ascertain what kind of manure is best suited for wheat. I applied barn manure to one spot, barn manure and lime mixed on another spot, and on a third spot, I applied lime alone. I have tried other experiments with barn manure, and from my experience I am fully persuaded, that, lime or calcareous manure is the best for wheat. I am about trying the efficacy of clover and buckwheat, ploughed down, as a manure. I intend sowing wheat in the clover, and rye in the buckwheat field.

To furnish putrescent, or animal manures for all our worn-out fields would require immense labor and expense. If lime will answer the same purpose—and I believe it will—* we should not much longer complain of poor land; for, in this country, we have an abundance of the best lime-stone and timber—and now, all that is wanting is knowledge and industry in the preparation and application of it to our lands; in both of these particulars, we must admit we are sadly deficient. We have but two alternatives, either to improve our lands, or to sell and go westward, where Providence has furnished a richer soil.

Suppose, for a moment, my whole farm to be as rich and as well cultivated as that one acre, (and I might have had it so if I had began to improve when I first purchased,) what would be the profit of it yearly? If on that one acre I make a profit of only $30, (and I am satisfied I will make more when the second crop is taken) my whole 225 acres would then yield me a profit of $6750, a sum greater than I can sell the farm for, and more than I have ever made on it since I owned it.

But suppose a clover crop to be twice as valuable as any other, I would still have $3375. I will now deduct one-half of that amount for pasture land and failure of crops, &c., and I would still have a profit of $1687. I will now suppose that $687 will be required to defray the expenses of the farm, I would still have a yearly profit of $1000.

I will now give you a short account of my profit and loss for a few years.

Now being able to work myself, and having no force of my own, I am necessarily compelled to have my work done by hired hands. After I became unable to labor myself, I found that my hired hands were sinking money for me. I then resolved to keep a strict account of all my farming operations. At the end of the first year, I found, on balancing the account, that I was $163 in debt. I examined the account, and endeavored to ascertain, if possible, where the fault lay. I satisfied myself sufficiently to make a second trial; accordingly, I dismissed my manager and some of the hands, and employed a more faithful and industrious manager, determined, if posssible, to profit by past experience. At the end of the next year, when my books were compared, I found I had made a profit of $93, a sum not half sufficient to pay the interest of the money I had laid out. A third trial is now going on, with the same manager, but more immediately under my own supervision, aided by all the knowledge I have been able to acquire from agricultural papers and other sources. I cannot yet make a fair estimate of the profits, but from present appearances, I think I shall realize near $500. Is it not astonishing to see the number of persons who subsist by farming entirely, still continue the old land-killing system, when such profitable results are to be expected from an improved mode of tillage?

Farming is both a pleasant and profitable employment, if properly carried on. The experience of thousands have taught us this, and any thing I could say, would not make it more clear.

I have been asked by some, "what use have we for rail roads? our population can consume all the surplus which we now have." I answer, if we had rail roads, the amount would be increased to a vast extent; our interest would become more united, and the danger of a disunion proportionably lessened.

A few words more to my brethren of the plough in East Tennessee. From the great irregularity of our surface, we have a great diversity of soils and climate, requiring the greatest agricultural skill, to ensure its full developements. Clover and lime, judiciously used, as a manure, will produce beneficial results, far beyond the expectation of those who have never tried them. Arouse then, brethren, to the improvement of your lands, and be assured, you will reap a reward, amply sufficient to compensate you for your labor.

WM. PEEPLES.

From the Register.

TO CURE THE BIG HEAD IN HORSES.

Take one quart of hog's lard, one quart of tar, and one pound of sulphur or brimstone; put all together in a pot over a slow fire, and boil it till the brimstone disappears; then make a mop on a strong stick, and rub the horse's head from the eyes to the nostrils once a day, until the mixture is all gone, and it will make a cure. I have tried one horse and did cure him sound and well. If you think the receipt worthy your attention, you can put it in your Register, with my name.

RICHARD B. HARRISON.

Dallas Co., Ala, April 19, 1836.

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* We would caution friend Peeples against an exclusive reliance on lime for manure, valuable as it unquestionably is. Nothing can justify the neglect of animal and vegetable manures, without the application of which, the permanent fertility of land cannot be obtained—but when united with the use of lime, the effect will no doubt equal his expectation: but in both cases it must not be forgotten, that to insure profitable results judicious tillage is indispensable.—ED. TEN. FAR.

THE "WATERLOO CÆSAREAN EVERGREEN CABBAGE"—ALIAS COW CABBAGE OF JERSEY.

The Farmer and Gardener of Sept. 13, introduces an account of this cabbage (taken from the last No. of the Horticultural Register of Boston,) in the following manner.

"We have a few hundred of these plants growing at our little establishment; but as the season has been inauspicious, and they have not had a fair chance for luxuriant growth, we cannot say what may be the result of our experiment. We obtained the seed of Robert Sinclair, jr. at $5 a pound, those in England are, or were, held at $5 for 20 seed. The next season we shall take time by the forelock, and give the article a more fair and perfect trial. If it should prove by proper test to realize a moiety of what has been said of it, it will certainly produce a new era in agricultural pursuits; but as the venders of the seed of new things, are not always the most scrupulous in pronouncing their eulogies on their virtues, time and actual cultivation are necessary in order that their capacities may be properly demonstrated.

In the more southern portions of our country, if this cabbage should prove as valuable as some of its encomiasts have stated it to be, it will, indeed, be a blessing. But of its properties after we have had time to form a correct practical opinion, we shall speak more fully."

Though the exaggerations of the English account given in the Horticultural Register, are partly neutralized by the remarks of its conductor, still there is some danger that there may spring up and spread over our land a *cow cabbage mania*, such as at different times has been excited by millet, Cobbett's Russian turnips, and Gama Grass. For this reason as well as for the amusement of our readers, we republish (from the Aug. No. of Loudon's Gardeners' Magazine,) this most impudent puff, and shameless yet very successful deception. The nostrums recommended by agricultural quacks and patent venders, like those of the medical quacks, are generally the more successful in proportion to the enormity of the pretension and falsehood.

"An individual in England having shown a specimen of this variety of what is properly a borecole, to Mr. Coke of Holkham, that gentleman expressed surprise at its size, &c. Advantages was taken of this to puff off, as the phrase is, this vegetable under a new name; viz. the Waterloo Cæsarean evergreen cow cabbage, and to sell the seeds at the rate of a sovereign for a packet containing twenty seeds. The following is an extract from the advertisement:—

'Patronised by His Majesty. Wonderful production of nature! Waterloo Cæsarean evergreen cow cabbage, of recent discoveey, unequaled in affording the most interesting and desirable results to the farmer, grazier, and manufacturer. This singular and extraordinary species of cabbage, almost unknown in England till introduced by the persevering efforts of Mr. Fullard, three years since, grows from nine to twelve feet high, and from fifteen to twenty feet in circumference. Five of these stupendaus cabbages, now raised to the greatest perfection in quality as well as size, have been repeatedly found, by proper management, an ample allowance of food for one hundred sheep, or ten cows, per day; and the nutrition thence supplied by this delicious vegetable will (as experience has already abundantly demonstrated) speedily produce the most surprising improvement in the *growth* and *utility* of every description of cattle. As an evidence of the beneficial tendency of this cabbage, Mr. F. has the great pleasure and satisfaction of saying, that sheep fed upon it have been found to produce wool of the finest silken texture, twenty-five inches long: a circumstance which cannot fail immediately to claim the utmost attention and amazement; as such, the cultivator of these cabbages will not only realize pecuniary profit beyond any previous experience, but the manufacturer will also obtain a material superior to any heretofore produced by the most profitable speculation, the general and extensive demand for which must exceed all present calculation. The commerce of the country, as well as the interest and pleasure of the community at large, will likewise be greatly, if not incalculably, enhanced by the cultivation and use of this improved vegetable production. This Waterloo Cæsarean cow cabbage has been pronounced by the father of the agriculturists, whom, from his well known experience, we are all bound to believe, to be the greatest wonder that ever appeared in the vegetable kingdom. It was shown to that very highly esteemed and truly respectible gentleman, T. W. Coke, Esq., Holkham Hall, Norfolk, in October last, when he immediately said—'*Mr. Fullard, you told me, three years ago, agriculturists were only half way advanced in improvement: this cabbage makes me say I am bound to believe you. I do say it is the greatest wonder the earth ever produced.*' Mr. Coke subsequently introduced several *dukes* and other *noblemen*, to the number of nine, to view this great production, all of whom expressed their astonishment, and engaged a part of the seed for use this year (1836.) These cabbages, if designed for use in the winter season, can, for convenience, as well as advantage to the grower, be then removed from the fields, and will serve to make handsome serpentine walks in gardens; or they will form a most excellent avenue for winter across a field; or, by setting them singly, will make a ground, that has not a tree in it, a park for winter, and may be given to the stock in spring. To obviate scepticism, and to afford the highest satisfaction and confidence as to the perfect rectitude of the statements here given, agriculturists, graziers, and all who feel an interest in the species of produce, are respectfully requested to apply to Mr. ——, wholesale perfumer, No. ——, ——, London, who will, with pleasure, exhibit specimens of the cabbage, and also wool of sheep fed with this vegetable production. Mr. —— is the sole agent in London for the Waterloo Cæsarean cow cabbage seed. All purchasers of it are particularly desired to sow it at the proper season (which is in July,) as stated in the directions which accompany the parcels, price 20s. each. The plants of this seed, unlike other vegetable produce for cattle, *never fail*, either numerically or in quality. A part of this seed has been engaged by His Majesty, and forwarded to Norfolk Farm, near Windsor, to be sown this season; and the production is already likewise patronised by most of the royal family. The Duke of Wellington, and the following gentleman, are a few only who have selected the seed for cultivation this year:—the Right Hon. —— Dymock, Champion of England; Robert Leeds, Esq., Surrey; Thomas Back, Esq., Wellesbro'; Joseph Cowen, Esq., Bladenburn; Sir William Folk, Norfolk; R. Preston, Esq., Barrister, Lincoln's Inn; —— Allington, Esq., Little Barford, near St. Neots; Edward Lindsell, Esq., Broon, near Biggleswade; Henry Walker, Esq., Corn Exchange; R. Sutton, Esq., Royal Exchange; —— Jesse, Esq., Hampton Court; Henry Hills, Esq., Allebury; Henry Handley, Esq., M. P., Lincolnshire; —— Perkins, Esq., proprietor of Islington Market; William Shield, Esq., Lincolnshire; Thomas Hudson, Esq., York; —— Hern, Esq., Bury St. Edmonds; —— Watkin, Esq., Windsor. It is desirable to remember, that these sweet vegetables, when boiled, are remarkably tender, and in flavor resemble asparagus. For the table, or culinary purposes, they will ever be highly appreciated. They grow in the form of a cone, and from the thickness of their foliage, and being evergreen, they will be found ornamental to a garden. The plants, after two months' growth (say in September,) require to be set out at the distance of two yards and a half from each other. They will grow on soil of moderate richness; but their greatest perfection will require soil of good quality. At any subsequent period to their being thus transplanted, they may be removed to any other place where convenience or taste may suggest. All letters from the country, requiring a packet of seed to be forwarded, must (to be attended to) contain a sovereign, or an order for the payment in London; and it is requested the name and address, where it is to be sent, be legibly written. Caution:—Any packet sold at a less price than a sovereign, either in town or country, cannot be genuine. Observe, also, upon each packet the circular seal, with this inscription: '——, No. ——.' It is important to observe, that none of the genuine cow cabbage seed will be sold after the month of July, for sowing this year (1836.')

'*Further Particulars.*—In reference to the length of wool produced by sheep fed upon the new colossal vegetable, as described in this prospectus, the proprietor, Mr. Fullard, to prove the fact, has now a lamb-hog, one year old, to be *seen* at Mr. ——, No. ——, ——, where T. W. Coke, Esq., of Holkham Hall, paid a visit on Tuesday, the 14th instant; and, upon due examination of the said lamb-hog, he declared, in the presence of many witnesses, that he never before saw such a specimen of wool for *length* and *fine* quality. Mr. F. has already been awarded *nine* premiums, by the Agricultural Societies, for the *superiority* of his sheep and other cattle.

'(Signed) ——, No. ——, .,

"The noise made by Cobbett's Locust was nothing to this. We are informed, on what we consider undoubted authority, that from 30 to 40 sovereigns a day were taken at the perfumer's shop referred to, for several months. The London seedsmen are regularly supplied with similar cow cabbage seed from Jersey; which is sold by retail, by Mr. Charlwood, at 1s. per ounce; an ounce, as we are informed by Mr. Cormick, containing about 5000 seeds, which would, of course, produce the wholesale perfumer £250 in ready money. As several gentlemen have called upon, and written to us respecting this cabbage, as they did about the time the *Gardener's Magazine* commenced, respecting Cobbett's Locust (see *Arb. Brit.*, p. 616,) we have thought it worth while to state the above; adding, that, as we know that our advice was not taken in regard to the locust, we doubt if it has deterred those who applied to us from purchasing the Cæsarean cabbage. The truth seems to be, that there is a portion of mankind who have a love for the marvellous to such an extent, as to become a disease which will have its course....... A correct estimate of the real merits of this cabbage, by Mr. Saunders of Jersey, who supplies the London trade with their seeds, was published in the *Gardener's Magazine* in 1829 (vol. v. p. 440.;) and it has also appeared in the *Encyclopædia of Agriculture*, 2d edit. p. 867."

A LONDON AUCTIONEER'S ADVERTISEMENT OF LANDS IN VIRGINIA.

[The following puff extraordinary, (taken from a late English paper,) furnishes another evidence of the system of fraud which is continued to be practiced in England, in the sale of mountain land in Virginia. As in a previous volume we commented at some length on these fraudulent sales, and as it would be to as little purpose again to endeavor to warn the dupes, we shall merely insert this advertisement, to amuse our readers in general, and to astonish those who may reside near the locality described, with the exalted character which their lands have acquired across the Atlantic.]

In the State of Virginia—A most important Estate for those of moderate means, and who would emigrate successfully.—Mr. George Robins is instructed to offer to public competition, at the auction mart, London, on Tuesday, the 9th of August, at twelve, in lots of 1000 and 2000 acres each. The Freehold Lands included in this important sale, extend to one hundred thousand acres, situate on the mighty waters of the great Ohio, in the commonwealth of Virginia—the neighborhood of rising towns, good markets, navigable rivers, and national turnpike roads. There is a direct communication by steam to New York, Orleans, Pittsburgh, Richmond, Baltimore, and Washington. Three vast rail roads have commenced, under the sanction of government, who have contributed fifteen millions of dollars towards the completion. In three short years they will be perfected. The lands are in the counties of Cabell, Harrison and Giles. They are fertile (almost beyond belief,) the soil adapted to the production of every thing that is useful. Industry and a little capital are alone wanting to render this one of the fairest agricultural portions of the globe, and in a climate, it must be remembered, remarkable for its salubrity and invigorating powers: besides which it may be called the land of promise, inasmuch as the mineral and fossil wealth is no where to be equalled, and iron, coal, lead, and salt are found in all directions in the greatest abundance. From the minerals on this property a source of commercial enterprize may be contemplated. It should be observed, in conclusion, that religious worship is unshackled, and there is a total absence of taxes. It may therefore be stated in great confidence, that this sale will secure to those of very limited means, wealth without risk; possessing the only essential requisites of industry and talent. A farmer having saved £100 or £200 from the wreck of his fortune here, will find at this sale, the opportunity to realise all his bright and early anticipations. It is not a speculation founded on theory—experience has demonstrated that it is a moral certainty; and consequently, a mechanic possessing £200 and upwards may confidently appear at this auspicious sale.

Particulars may be had at the Waterloo, Liverpool; the Manchester Times Office, at Manchester; the Hen and Chickens, at Birmingham; the Auction Mart; and at Mr. George Robins' Offices, in Covent Garden. The title is clear beyond the possibility of doubt."

ON RAISING TWO OR MORE SUCCESSIVE CROPS OF COCOONS IN EACH YEAR.

When any culture, or other business, is new in a particular country, and yet is rapidly spreading, and employing many heads to direct, as well as hands to execute, there are sufficient reasons why there should be many new discoveries, more important than any which a century had brought to light in countries differently situated. In such circumstances, each man engaged in the business is more or less a learner, and therefore necessarily an experimenter. Where all are novices, he can find no where truths established by experience, or opinions (true or false) venerable from age. He is thrown upon his own resources, and compelled to exercise his own reason and inventive genius. The consequence is, that among many errors and losses, some new and useful truths are sure to be discovered—and these are speedily and extensively made known, by the universal prevailing desire to seek and profit by instruction on the subject. Hence it is, that new as silk culture is in this country, improvements have already been made, and questionable points have been brought into discussion, which had scarcely been thought of in Europe or Asia, where this business has been pursued, and to great extent, for centuries. Among these debated points, is the possibility of profitably rearing more than one crop of cocoons in a season. The affirmative has been maintained in this country—but not upon sufficient ground of facts and experience to command general assent.

But though in Europe, this question had before scarcely attracted any notice, it is from that quarter that we are now presented with valuable and convincing experiments, made as their projector and conductor evidently supposes, as to a subject entirely new. The importance which M. Loiseleur-Deslongchamps attaches to his discovery, is evinced in the title to his communication, (published in the *Annales de l'Agriculture Francaise*, for July, 1836,) which reads thus: "*New considerations upon the means of doubling, in France, the crops of silk, by making, each year, many rearings of silkworms*," &c. His experiments were accurately conducted, and are clearly detailed; and they will serve to throw much light on, if not to remove all doubt from the subject. Passing over his more general and introductory observations, we proceed to translate what is material and useful. After stating the great amount of raw silk annually imported into France, and the necessity of supplying her manufactures from her own products, he proceeds thus:

> "From the moment that I knew of the enormous quantity of raw silk that our manufacturers purchased from foreign countries, I had the idea that we might double the product of the material, in France, if, instead of a single crop of cocoons, it was possible to have many. But I sought in vain then, in the authors within my reach, what they had said upon this subject, I found nothing positive (*de bien positif*) in Boissier de Sauvages, in Dandolo, in M. Bonafous, and others, that I consulted. Sauvages indeed had made some attempts to preserve the eggs of silkworms beyond the ordinary time, by heaping a certain quantity together, and covering them with gum: but the trial had no success. Without explaining how multiplied hatchings were made in India, Dandolo and the author of the article "Ver à soie" in the *Nouveau Cours complet d'Agriculture*, say that in certain parts of that country, 12 crops of silk are made every year; but neither of them indicate in any manner the process necessary to procure this product. It was necessary then to seek how to arrive at it: besides, the difference of climate is so great, that there was no probability that what was practised in India, would be applicable to France.
>
> "The first trial which I made to procure a second generation of worms was, by hatching a small packet of eggs laid during the same season, in July, 1823. Though kept exposed to the heat of the human body, from August 1, to the end of Septmeber, none were hatched: there came out not a single living worm—and after the two months of incubation, all the eggs were shrivelled and dried. It was necessary to have recourse to other means."

Thence supposing that exposure to the mild temperature of spring was necessary, after the cold of winter, M. Deslongchamp was led to believe—

> "that if the eggs of the silkworm could bear, without injury, the temperature of an ice-house, it would be the sure and easy means of carrying on, every year, several successive rearings, and consequently of augmenting considerably the usual product of silk. In consequence, in the first days of March, 1834, I placed in the upper part of an ice-house, at the temperature of zero,[*] or at most, at but a degree higher, many little glass vessels, containing silkworm's eggs. My design was to withdraw them successively in the course of the spring and summer, so as to make hatchings and raisings that would succeed each other without interruption. In order to preserve my eggs from the great humidity which always prevails in ice-houses, I had the vials well stopped, and carefully sealed with wax...... On the following 3d of July, I withdrew one vial from the ice-house; and for fear lest too abrupt a transition from a temperature of one degree above freezing, to 17 or 18, (which was then the temperature of the open air at mid-day,) should occasion some damage to the eggs, I took them from the ice-house very early in the morning. Half an hour after, I placed the vial containing them in a cellar, where they remained for twenty-four hours: and at the end of that time, it was removed to the coldest part of my apartment. In short, I exposed the eggs to increased heat as gradually as possible, to the time when placed for incubation—which lasted 8 days, and by which, the hatching was obtained on July 17. I kept all the worms that left the eggs on that and the next day, and of them made a raising (*éducation*) which lasted a little more than 36 days, and from which I took away a suitable number of cocoons for a purpose of which I shall speak hereafter."

In the same manner, and with like precautions, a second hatching was produced on August 4th. Previously, experiments had been made by keeping the eggs altogether in a cellar: but the variation of temperature (from 6° to 9½°) was too great, to keep the living principle dormant, and thereby preserve it for future action.

> "It will suffice to say, that in 1824, I made, successfully, five complete raisings of silkworms, at the following times.
>
> "The first was the natural raising—that is to say, it was commenced May 10, with worms hatched some days after the opening of the leaves of the mulberry. The cocoons which it yielded, weighed, on an average, 34 grains each, and 220 made a pound.[†]
>
> "The second raising, retarded by means of a temperature of 6°, (above freezing,) commenced May 29 to 30. The cocoons obtained, were weighed too late to estimate justly their true weight.
>
> "In the third, again retarded by the same means, my worms were hatched June 20; and they made, from the thirty-fourth to the thirty-ninth day, cocoons of which 230 made a pound. The lightest of them weighed 30 grains, and the heaviest 53 grains.

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[*] The Thermometer referred to in this piece, is the Centigrade, according to the scale of which *Zero* (0°) is the freezing, and 100° the boiling point.—Ed. Far. Reg.

[†] The French pound is heavier than ours by one tenth—92.64 of the former being equal to 100 lbs. avoirdupois.—Ed. Far. Reg.

"The fourth raising, on which I have sufficiently explained above, furnished cocoons which weighed much less than those of the three first, since 280 to 290 were required to make a pound.

"The product of the fifth was still more feeble, the cocoons being 350 to 360 to the pound.

"I shall resume my remarks upon the products of each of these five crops, made in 1824: but it is proper to mention, first, that after having completed them, with a success which I had scarcely dared to hope, I believed that I had made a discovery; and as I could not doubt the advantages which silk culture might derive from it, I hastened to publish it. I read, upon this subject, a memoir before a learned society: but to my great surprise, I was listened to with coldness. Indeed, so little sensation did my memoir produce in the audience, that it was plain that nobody had comprehended of what importance might be the proceeding, which I had announced......

"However, notwithstanding the disregard of the public, I continued, the following year, my experiments and observations; and in the course of the spring and summer, I made 6 raisings, of which, one was natural, two retarded by the temperature of the cellar mentioned above, and the three last, by making use of the ice-house. These six crops gave (as the year before,) products more or less satisfactory: but having remarked that the first were much better than the last, I limited myself, the two following years, to making three raisings only, instead of five or six. In 1827, the first raising was begun April 18, and finished June 16; the second was from May 8, to June 30; and the last, commenced June 1, was entirely finished on July 15: so that in less than 90 days I obtained three crops of cocoons. All the raisings have been entirely effected without artificial heat—which of course prolonged the time."

The communication of M. Deslongchamps is marked to be continued in the August No. of the *Annales*, and when the continuation is received, whatever it may contain, worthy of publication, will be translated and given to our readers.

The smaller weight and less value of the later crops of cocoons, cannot be owing to any deterioration of value in the eggs, nor in the difference of the prevailing temperature—but most probably to the more advanced maturity of the leaves, rendering them less suitable as food.

Since writing the greater part of this article, we have received Kenrick's Silk Grower's Guide, which contains much more full and particular information than we were aware of on this subject, and derived from facts that have occurred in this country. The chapter on "Second and successive crops of Silk," will be given in the next number of the Farmers' Register.

VERD ANTIQUE MARBLE.

A quarry of marble, more brilliant in hue, and susceptible of a higher polish, than any we have observed, has recently been opened in New Haven, about two miles from the public square.

The quarry is so located, as to afford every facility in access to market. The marble is of the purest species of *Verd Antique*, with golden or yellow streaks interwove. We know not whether the "Verd Antique" has been found among any other marbles than those derived from the quarries of Egypt. The specimens that have been shown to us, surpass any that we have seen in the cabinets of science, and museums of our country. Its firmness of texture gives to the artist the advantage of the highest polish; and in beauty and variety of coloring, it cannot be surpassed.—*Am. Historical Magazine.*

HAERLEM RAIL ROAD TUNNEL.

This stupendous undertaking, it is expected, will be completed in about six weeks. The tunnel is already through the mountain 475 feet on the north side, and 60 feet on the south, and about 60 feet more remains to be cut before the workmen meet. This tunnel, when completed, will be the largest, though not the longest, in the world, and cut through rock of as hard and firm a texture as can any where be found. The open cuts on either side of the tannel are almost terrific to gaze at from the edge of the summit. They are through the solid rock, and that on the north side is 55 feet deep. The work is prosecuted under the direction of Mr. Rutter, the able and skilful superintendent, night and day. When completed and connected with the adjoining scenery, it will form one of the grandest and most romantic sights to be found on the face of the globe.—*N. Y. Times.*

BROOMS.

We have been informed, says the Pawtucket Chronicle, that our enterprising friends the Messrs. Summers, last winter, shipped several thousand brooms from New Orleans to Boston and realized a handsome profit by the transaction.

This is reversing the current of trade, and proves that Southerners can compete with Yankees even at their own doors.

Southern broom corn is very superior to the Northern article, being finer and more abundant; as it is free from seeds it offers no attractions to the rats which often make sad havoc with the northern article.—Would it not be an object for some of our northern broom manufacturers to import the southern broom corn, as it can be purchased at a cheaper rate than they can obtain the production of our New England farmers.—*R. I. Journal.*

THE CORN TRADE.

Bread-stuffs have hitherto constituted one of our principal articles of export, amounting in 1831 to within a small fraction of $12,000,000. In 1835, (we speak, in both cases, of the commercial year, ending 30th September,) the quantity was reduced one half, and the value in about the same proportion. In 1831, the value of bread-stuffs *imported* was only $1032, whereas in 1835 it had increased to $311,116. The year ending the 30th of the present month will show still smaller exports of these articles, and larger imports. And the ensuing year, from present appearances, will very possibly show an amount of imports equal to the exports. Should the corn crop be cut off in the northernmost states, as it is now very liable to be, by the early appearance of frost, the extraordinary phenomenon will probably occur, of the greatest grain-growing country in the world becoming dependant upon foreign countries for a portion of its bread!—*N. Y. Journal of Commerce.*

INFORMATION AND AID WANTED, FOR THE PURPOSE OF PROPAGATING THE BEST NATIVE GRAPES.

A subscriber to the Farmers' Register wishes to obtain, through this journal, information that will aid him and others in selecting and rearing the best existing varieties of native grapes. The object of this gentleman in this, as in other more important labors of his long and highly serviceable life, is not his private benefit, but the public good. We know that he has already done much, though without claiming the merit, in spreading the knowledge, and inducing the propagation of some of the most valuable native grapes. The aid of the readers of the Farmers' Register, if given to this object in the manner desired, will, easily and beneficially to all concerned, increase and quicken, an hundred fold, the results of such efforts, as any one individual, however zealous he might be, could make for this purpose.

All wild grapes are seedlings: and as grapes frequently, (though perhaps not generally,) produce from the seeds fruit quite different from that of the parent vine, it follows that new varieties may be, and are thus continually produced, without the design or the aid of man. Each of our best native kinds, now extensively known and highly prized, has been at first obtained from some single seedling, discovered by accident, and brought to notice by its happening to be observed by some one not so regardless of such things as most persons are. Many single seedling vines now exist, producing fine fruit of peculiar kind, and which are not known except in their neighborhood, and may be lost entirely for want of some person's taking care to perpetuate the kind, by grafts or layers. To bring to light all such vines, it is requested of our readers to aid in bringing together the scattered and almost unknown facts. For this purpose, it is only necessary that any seedling vine, producing fruit of rare and valuable qualities, shall be described minutely and fully, so that it may not be confounded with any different kind—and its locality particularly stated, so that any persons desirous to propagate such varieties, may be sure to obtain cuttings. If such descriptions, (with responsible signatures,) are directed to the Farmers' Register, they will be published for general information and use.

The gentleman who has commenced making a collection of the best native grapes, and at whose suggestion we propose this plan of aiding him and others in such attempts, has already growing, though not yet bearing, vines obtained from various seedlings of which he had heard favorable accounts: and he will furnish his testimony of their value, so soon as their products shall enable him to give a full and correct report.

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THE

FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the improvement of the Practice,

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

Vol. IV. NOVEMBER, 1836. No. 7.

And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." *Swift.*

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HAMPDEN SIDNEY COLLEGE.

THE winter session will commence the 1st day of November, and terminate the 3d Wednesday of April, with a recess of ten days at Christmas. The course of instruction in this institution has recently been enlarged, and some very important additions have been made to the Chemical and Philosophical Apparatus. It may also be proper to state that the Professorship of Chemistry and Natural Philosophy is now filled by a gentleman with whose reputation in these departments of science, the public are already in some measure acquainted. It is confidently believed that the arrangements now made, and the system of discipline pursued, will afford the facilities for an education as thorough and extensive as that of any college in our country: while the location of the college, in the midst of a highly refined and moral community, brings the students under an influence the most salutary in the formation of their characters.

The officers with their respective departments, are,

D. L. CARROLL, D. D.—President, and Professor of Intellectual and Moral Philosophy, Political Economy and National Law; and Lecturer on the Evidences of Christianity.

JNO. W. DRAPER, M. D.—Professor of Chemistry, Natural Philosophy and Physiology.

PIKE POWERS, A. M.—Professor of Mathematics. In this department the course of instruction will be extended through the Differential and Integral Calculus, including some of their applications.

ROBERT G. BRANCH, A. M.—Professor of Ancient Languages, Ancient History and Geography, and Greek and Roman Antiquities.

Besides the regular course of instruction, the following independent schools are established in the College.

National Jurisprudence, Lectures on the Constitution and Laws of the United States: By D. L. Carroll. Fee $10.

Analytical Chemistry, applied to Minerology and Geology: By Jno. W. Draper. Fee $20.

Civil Engineering: By Pike Powers. Fee $15.

French and Spanish Languages: By R. G. Branch. Fee $10.

Regular Expenses: Tuition $30.—Board from $9 to $10 per month, payable in advance for the whole session. Room rent $6. Servants' hire $1 75.

It is very desirable that students should attend at the commencement of the session.

PIKE POWERS, *Clerk to the Faculty*.

Oct. 4, 1836.

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THE FARMERS' REGISTER.

Vol. IV. NOVEMBER, 1836. No. 7.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

ON THE IMPROVEMENT OF TOBACCO LANDS BY CLOVER.

Addressed to the Charlotte Agricultural Society, at its Annual Meeting, held the 17th August, 1836, by Anderson C. Morton—and ordered to be published in the Farmers' Register.

The 22d article of our constitution, makes it the duty of each member to make a communication at the annual meeting, on some agricultural subject. More in obedience to this requisition, than from the hope of affording any thing valuable in itself, or acceptable to the meeting, have I prepared a sketch, which, if not deserving commendation on any other account, shall at any rate claim the credit of brevity.

It is said that every man has his hobby, and that hobby is apt to be indulged in, at the expense of every thing else: but this thing of riding one's hobby, has not unfrequently led to results very important to the world. Now I shall present to the Society, a subject which I have more than once urged, and which, I believe, will go far to restore the exhausted soil of our country. It is the cultivation of the grasses, clover included; not the mere seeding, but that earnest, persevering, skilful cultivation, which will insure success. Too many of our planters, hearing of the success of those who have resorted to the cultivation of the grasses, have gone heedlessly to the expense of buying seeds and sowing them on lands actually too poor to grow them; and instead of seeing their lands thus enriched, and reaping rich harvests, only reap disappointment. If this were not a very common error, it would be useless to expose it: indeed, so common is it, that it is strange it does not correct itself. It shows that grass is looked upon by some, as the panacea by which every disease of old mother earth is at once to be healed, and by which her most barren spots are to be made to bear abundant crops. There is an infatuation in the minds of some people on this subject, that seems scarcely to invade them in relation to any other belonging to agriculture. We should think very strangely of the man who should select his poorest spots for raising tobacco plants: yet it requires just as much manure to prepare the soil for the production of a heavy crop of grass, as of tobacco. Grass is, beyond all question, one of the most powerful agents in promoting the improvement of, and in preserving our lands, that has ever been employed; but like every other agent, it must be rightly applied. Judging from actual experiment, I am led to conclude that land made rich enough to produce a heavy crop of tobacco and wheat, will produce heavy crops of grass, and that such land may be cultivated on the three-shift system: say, one crop of tobacco, one of wheat, and one of clover, *ad infinitum*, without deterioration, if not with a gradual improvement. Indeed, I think I am warranted by my experience, in saying that such lands, if naturally adapted to the growth of tobacco, wheat, and clover, will, on this system, rapidly improve, even without the aid of plaster; and with its aid, would no doubt continue to advance until it reached the very highest point of fertility. The best tobacco on my plantation at this time, is on land that has never been manured, and has been cultivated for nine years on this plan, and it is the most promising crop that has ever grown on the land since it has been reduced from the forest state; and one heavy crop of grass has been mowed from it within that time, though, when ploughed last spring, it was thickly coated with the last years' growth. It has been my object, for years past, to get all my tobacco land under this system. That object was nearly completed last year. Nine fortieths of my crop was on land that had been put in grass, and after losing two or three hogsheads by the frost, I still secured a much finer crop than I ever made before. This year, my object had been fully carried into effect, had I not sold my land; and I should hereafter have been able, through the aid of clover and grass, to have carried on the tobacco culture without applying one single particle of manure to it. And judging from my observation and experience of the past, I doubt not, that in ten years more, by applying the manure to the corn land, my crops would have been doubled. And in thus adding to my resources for tobacco, I have also, in the same proportion, improved my crops of wheat. Had I remained on the land another year, the whole of the crop of wheat would have been on tobacco land, and every part of the land now in tobacco, seeded in wheat; and still land enough in grass, which comes in rotation next year, for the whole crop of tobacco.

In recommending this system, I feel the utmost confidence, having given it such a test as proves to me, most conclusively, that when lands are adapted to grass and clover, and made rich enough to produce heavy crops, they may be not only kept up for tobacco, but improve yearly. And the same system, if pursued in regard to the corn land, would give precisely the same results.

In this system, there is nothing fanciful. It is based on common sense principles; it is simple, easy of application, adds nothing to the labor of the planter, and goes hand in hand with the cultivation of tobacco. But in order to carry it fully into effect, we must have, what is not uncommon in this country, ample space for standing pasture: we must vary our scene of manuring every year, and what we do manure, must be made rich. When there is land to clear, it comes happily to the aid of this system, as no land ought to be cleared for tobacco, that is not sufficiently fertile to be kept up by it; nor need any land be expected to be made rich by sowing grass, when it is too poor to produce it. I would not discourage any attempt to raise grass, but only urge that, to raise it successfully, you must give it the means of growing. You might as well expect to make your stock thrive without food, as grass grow, when the soil is too poor to produce it. But feed your soil with manure, cover it with grass, and you may calculate, certainly, on its paying you well for your labor.

This system requires time, I know, as well as patience and perseverance. But it is completely within the reach of every man in this house. There are those who contend that the cultivation of tobacco is utterly at war with the improvement of our lands, and that to improve at all, we must first abandon this crop. But if the system which I recommend be based on true principles; if it be practicable—if it be in the reach of all—what hinders us from going into it at once? One of our worthy members, very truly and wisely at the last meeting, told us, that to abandon our tobacco crop, would be an abandonment of our country. What other resource have we? None. I conceive this doctrine, that we cannot make tobacco and improve our lands, as fraught with incalculable mischief: it acts as an extinguisher to every praiseworthy effort, and a damper to every generous motive of those who would take up the cause of agricultural improvement, and urge it upon the people; and its prevalence has driven more of our industrious citizens to emigration than all other causes combined. But it is a remarkable fact, that this doctrine is held only by those who have done nothing for the good cause, either by their own example, or by encouraging the efforts of others—those who are not satisfied to receive daily a golden egg from the goose, but must rip her at once. I am, perhaps, too sanguine; but I do verily believe that this portion of Virginia is as highly susceptible of improvement as any portion of the globe: and I as firmly believe, that the cultivation of tobacco does not (however it may, and does impede our progress,) impose, necessarily, a complete check to improvement. All know that it requires rich land, and that lots producing heavy crops of it, will produce heavy ameliorating crops, and by changing the scene of manuring yearly, you will yearly add to the surface. Those who choose to make the calculation, may very easily tell how many years it will require, to manure a surface sufficiently large to give them a three shift rotation. The man who cultivates 100,000 hills, can clear and manure 50,000, annually. Say that he does this next winter, and in the fall of '37, seeds it in wheat and clover, and so on, annually adding 50,000 hills to his available surface, he may, in six years, have secured 300,000 hills, which will give him the full amount of tobacco land; and after that, the whole of his manure may be applied to his corn land. Is there any thing absurd or impossible in this? I think not. So far from being discouraged at this view of the subject, we have every reason to press forward. Indeed it would not be absurd—it would not be unreasonable to say, that by a judicious, economical, and persevering adherence to this or some other similar system, an ordinary farm may become one common scene of luxuriance, a perfect Goshen, or one great tobacco lot—and that in no great many years. Thus, in a life of thirty years, the man who annually manures twenty acres, would see himself surrounded by a plantation of six hundred acres of land, every acre of which would be rich enough for a garden. He would then have no reason to sever the ties of blood and friendship, and bury himself and his sons in the wilds of the west, or the poisoned swamps of Arkansas, or mingle with the mongrel races of Texas.

Gentlemen, we listen too much to discouragements. Virginia is ruined by the mistaken policy of her sons, and that sad mistake, that the cultivation of tobacco is necessarily ruinous. I know that great popular changes are not often produced by reason alone; but here we have interest, love of country, and various other considerations working in favor of our cause, and strengthening our arguments in establishing the fact, that our country is not doomed to hopeless desolation.

I shall, before your next meeting, in all probability have changed my place of residence; but I shall retain my membership, and gain all I can by occasionally meeting you here: and should I ever have it in my power to contribute my mite to the great cause, either here or elsewhere, I shall be prompt to do it. Emigration, legislation, and still more, reckless cultivation, or rather mutilation of her soil, has kept this old commonwealth down, until many seem to think she is in a hopeless decline; but though her energies are crippled, she is yet a noble star of the old constellation. She will rouse herself. She has materials enough, if her sons will still remain to maintain her weight. Her institutions of learning, her agricultural societies, her rail roads, her canals, must rouse her from her Rip Van Winkle slumber. She will yet put on her beautiful raiment, and renew her youth, and resume her stand among the old 13: And it is you, and such as you, that must be the instruments of this new creation. I have the most satisfactory evidence, that this society has already given an impulse that will be long and deeply felt. The people need to be roused. Set them to thinking, and half the battle is over. But if you suffer your efforts to be palsied—if you let this institution sleep the sleep of death, I care not what may be your individual example, your influence will be lost.

I hope then, your devotion to the best interest of your community, as well as regard for your own, will keep you together as a band of brothers.

I hope that I shall be excused for keeping you so long with this disjointed sketch, and only regret, that in return for your patient attention, I have not given you something to merit it.

From the History of Insects in the Family Library.

NATURAL HISTORY OF ANTS.

[Continued from p. 333 vol. IV.]

The wonders of the ant-tribe are far from being exhausted; we have seen them subjugating their own species, and reducing them to the condition of domestic slaves. But a more singular trait in their manners remains to be stated. They keep and feed certain other insects, from which they extract a sweet and nutritious liquid, in the same manner as we obtain milk from cows. There are two species of insects from which the ant-tribe abstract this juice—the aphides, or plant-lice, and the gall-insects. Linnæus, and after him other naturalists, have called these insects the milch cattle of the ants; and the term is not inapplicable. In the proper season, any person, who may choose to be at the pains of watching their proceedings, may see, as Linnæus says, the ants ascending trees that they may milk their cows, the aphides. The substance which is here called milk is a saccharine fluid, which these insects secrete; it is scarcely inferior to honey in sweetness, and issues in limpid drops from the body of the insect, by two little tubes placed one on each side just above the abdomen. The aphides insert their suckers into the tender bark of a tree, and employ themselves without intermission in absorbing its sap; which, having passed through the digestive system of the insect, is discharged by the organs just described. When no ants happen to be at hand to receive this treasure, the insects eject it to a distance by a jerking motion, which at regular intervals they give their bodies. When the ants, however, are in attendance, they carefully watch the emission of this precious fluid, and immediately suck it down. The ants not only consume this fluid when voluntarily ejected by the aphides, but what is still more surprising, they know how to make them yield it at pleasure; or, in other terms, to milk them. On this occasion the antennæ of the ants discharge the same functions as the fingers of a milk-maid: with these organs, moved very rapidly, they pat the abdomen of an aphis first on one side and then on the other: a little drop of the much coveted juice immediately issues forth, which the ant eagerly conveys to its mouth. The milk of one aphis having been thus exhausted, the ant proceeds to treat others in the same manner, until at length it is satiated, when it returns to its nest.

A still more singular fact, connected with this branch of the natural economy of these insects, remains to be stated. These cows are not always considered the common property of a whole tribe; on the contrary, some of them are appropriated to the exclusive use of the inhabitants of a particular hill or nest; and to keep these cows to themselves, they exert all their skill and industry. Sometimes the aphides inhabiting the branches of a particular tree, or the stalks of a particular plant, are thus appropriated; and if any vagrant foreigners attempt to share this treasure with its true owners, the latter, exhibiting every symptom of uneasiness aud anger, employ all their efforts to drive them away.

Some species of ants go in search of these aphides on the vegetables where they feed; but there are others, as the yellow ant, which collect a large herd of a kind of aphis, which derives its nutriment from the roots of grass and other plants. These milch kine they remove from their native plants and domesticate in their habitations, affording, as Huber justly observes, an example of almost human industry and sagacity. On turning up the nest of the yellow ant, this naturalists one day saw a variety of aphides either wandering about in the different chambers, or attached to the roots of plants which penetrated into the interior. The ants appeared to be extremely jealous of their stock of cattle; they followed them about and caressed them, whenever they wished for the honeyed juice, which the aphis never refused to yield. On the slightest appearance of danger, they took them up in their mouths, and gently removed them to a more sheltered and more secure spot. They dispute with other ants for them, and in short watch them as keenly as any pastoral people would guard the herds which form their wealth. Other species, which do not gather the aphides together in their own nest, still seem to look on them as private property; they set sentinels to protect their places of resort and drive away other ants; and, what is still more extraordinary, they enclose them as a farmer does his sheep, to preserve them not only from rival ants, but also from the natural enemies of the aphis.

If the branch on which the aphides feed be conveniently situated, the ants have recourse to a very effectual expedient to keep off all trespassers: they construct around the branch containing the aphides a tube of earth, or some other material, and in this enclosure, formed near the nest and generally communicating with it, they secure their cattle against all interlopers.

The brown ant has been observed by Huber to build a chamber around the stem of a thistle, in such a way that the stalk passed through the centre, so that from their ant-hill they had only to climb the thistle-stalk, in order to enter this cattle-fold, which was suspended in mid-air. The interior, smooth and compact, was entirely formed of earth; it contained an extensive family of insect-cows, sheltered from the inclemencies of the weather, and protected from their enemies. These edifices are not always constructed near the bottom of the thistle-stalk; once Huber saw one at the height of five feet from the ground. "These proceedings," says he, "are by no means common: we cannot attribute them to an habitual routine." Indeed, the modes of preserving their cattle seem to be as various as those practised by man. Some ants receive their food from the aphides which suck the juices of the common plaintain, and these at first take their station near the flower of the plant; as soon as the flowers wither, these insect-cows take shelter under the radicle leaves; upon which the ants, which before had climbed up to them, now surround them with a mud wall, and, making a covered gallery by way of communication between their nest and the "paddock," extract food from them at their convenience and pleasure.

During autumn, winter, and spring, many species of ants keep aphides. Indeed, in winter they would be exposed to the horrors of a famine, did they not rely for food on their cattle; for though they become torpid when exposed to intense cold, yet, for the most part, the depth of their nests preserves for them a temperature sufficiently high to prevent this contingency. Their milch cows are then kept on the roots of the plants which penetrate the interior of the nest, and furnish an abundant supply of liquid in which their keepers delight. And not only is the full-grown animal kept, but its eggs are watched and guarded with that care which warrent us in supposing that the ant knows their full value.

It is of real consequence to the ants that the hatching of the eggs of the aphides should take place as early in the spring as possible, in order to ensure an early supply of food for their colony; and with the view of hastening this event, they deposite them in the warmest part of their dwelling.

The mode in which the habitations of the ants are constructed varies according to the species of this insect. Some excavate their dwellings, and are hence denominated *mining* ants; others build them on the surface of the ground, and are, in consequence, termed *mason* ants; and a third species take up their residence in hollow trees. But whatever may be the mode in which they form their habitations, they always contrive to shelter themselves completely from the rain. The longest and loftiest chamber is placed near the centre of the nest, and here all the galleries terminate; the subterranean chambers are horizontal. In the evening, the aperture of the nests of some ants is always closed, and in the morning re-opened; but according to Huber, the brown ant has been seen to work during a moon light night.

Having in the day time noticed some aphides upon a thistle, he examined it again in the night about eleven o'clock, and found his ants busy milking their cows. At the same hour, another night, he observed, on an elder-tree, the little negro-ant engaged in the same employment.

From the result of their labors, it might be inferred that they were actuated by a common mechanical instinct, yet this is by no means the case: no two apartments are alike in the same nest; and no two nests have exactly the same arrangements. Each ant seems capable of conceiving a a particular plan, which is in some manner made intelligible to the rest, and practically executed. If pieces of straw be placed conveniently for its purpose, an ant, after careful examination, proceeds to make use of this appropriate supply of materials. In another case it would have to drag bits of stubble, then arrange them, and then build. The operations of these insects vary very much from the beautiful and geometrically precise labor of bees. Indeed they seem to act so completely according to the exigencies of each case, that the moving power which impels and guides their operations approaches so closely to human reason, that to establish a distinction appears extremely difficult.

The strength and perseverance of ants are perfectly wonderful. Kirby state, that he once saw two or three horse-ants hauling along a young snake not dead, which was of the thickness of a goosequill. St. Pierre relates, that he saw a number of ants carrying off a Patagonian centipede: they had seized it by all its legs, and bore it along as workmen do a large piece of timber. Nothing can divert them from any purpose which they have undertaken to execute. In warm climates they may be frequently seen marching in columns which exceed all power of enumeration; always pursuing a straight course, from which nothing can cause them to deviate: if they come to a house or other building, they storm or undermine it; if a river cross their path, they will endeavor to swim over it, though millions perish in the attempt.

It is related of the celebrated conqueror Timour, that being once forced to take shelter from his enemies in a ruined building, he sat alone many hours: desirous of diverting his mind from his hopeless condition, he fixed his observation upon an ant which was carrying a grain of corn (probably a pupa) larger than itself, up a high wall. Numbering the efforts that it made to accomplish this object, he found that the grain fell sixty-nine times to the ground; but the seventieth time it reached the top of the wall. "This sight," said Timour, "gave me courage at the moment, and I have never forgotten the lesson it conveyed."

The Jesuit Dobrizhoffer, in his History of the Abipones, gives the following very singular account of the ravages of ants known in Paraguay. He furnishes no means of ascertaining the species whose proceedings he describes. "The largest ants which I had an opportunity of seeing are formidable on account of their undermining buildings. They make burrows, with infinite labor, under churches and houses, digging deep, sinuous meanders in the earth, and exerting their utmost strength to throw out the loosened sods. Having got wings, they fly off in all directions, on the approach of heavy showers, with the same ill fortune as Icarus, but with this difference, that he perished in the sea, they on the ground, to which they fall when their wings are wetted by the rain. Moreover those holes in the earth by which the ants used first to pass admit the rain-water, which inundates the caves of the ants, and undermines the building, causing the wooden beams that uphold the wall and roof, first to give way, and, unless immediately supported, to fall along with the house. This is a common spectacle in Paraguay. The whole hill on which St. Joachim was built was covered with ant-hills, and full of subterranean cavities. Our house and the one adjoining suffered much from these insects. The chief altar was rendered useless for many days; for, it being rainy weather, the lurking ants flew in swarms from their caves, and not being able to support a long flight, fell upon the priest, the altar, and sacred utensils, defiling every thing. Ten outlets by which they broke from their caves being closed up, next day they opened twenty more. One evening there arose a violent storm, with horrible thunder and lightning. A heavy shower seemed to have converted our court-yard into a sloping lake, the wall itself withstanding the course of the waters. My companion betook himself to my apartment. Meantime, an Indian, the churchwarden, arrives announcing that the floor of the church was beginning to gape, and the wall to open and be inclined. I snatched up a lamp and ran to the place, but had hardly quitted the threshold of my door, when I perceived a gap in the earth; and before I was aware of any danger, sunk up to the shoulders in a pit, in the very place of the chief altar, but scrambled out of it, by the help of a churchwarden, as quickly as I had got in, for under that altar the ants seemed to have made their metropolis: the cavern was many feet long and wide, so that it had the appearance of a wine-cellar. As often as earth was thrown in by the Indians to fill it, so often was it dug out by the ants. In this universal trepidation, all the Indians were called to prop the gaping wall of the church with rafters and planks. The greatness of the danger rendered it impossible to remain quiet, whatever arts were adopted. That same night I removed from my apartment, which was joined to the church with the same beams and rafters, in such a manner, that if one fell, the other could not avoid being involved in the ruin. I have read that in Guiana, rocks and mountains have been undermined, walls thrown down, and people turned out of their habitations by ants, which I can easily believe having myself witnessed similar or even more incredible events.

"In Paraguay I was made thoroughly acquainted with the powers of ants. They are weak, and compared with many other insects, diminutive; but numbers, labor, and unanimity render them formidable, and endow them with strength superior to their size. In the plains, especially those near the Paraguay, I have seen ant-hills, like stone parymids, three or more ells high, with a broad base, and composed of a solid material as hard as stone: these are the storehouses and castles of the ants, from the summits of which they discern sudden inundations, and safely behold the floating carcasses of less industrious animals. Elsewhere I have seen an immense plain, so covered with low ant-hills, that the horse could not move a step without stumbling. In the plains you may often observe a broad path, through which you would swear the legions of Xerxes might have passed. The Spaniards hollow out these pyramidal heaps, and use them for ovens, or reduce them to a powder, which, mixed with water, serves admirably to floor houses. Pavements of this kind resemble stone in appearance and hardness, and are said to prevent the breeding of fleas and other insects. But hear what mischief ants commit within doors. They flock in a long and almost endless company to the sacks of wheat, and in a journey uninterrupted by day or night (if there be a moon,) carry off by degrees some bushels. They will entirely strip fruit trees of their leaves, unless you twist a cow's tail round the trunk to hinder their ascent, and eat away the crops so completely that you would think they had been cut with a sickle. Moreover, ants of various kinds are extremely destructive both to vineyards and gardens, devouring vegetables and pulse to the very root. Set a young plant in the ground, and the next day you will seek it in vain. They refrain from pepper on account of its pungency. If you leave meat, either dressed or raw, in your apartment, you will soon find it blackened with swarms of ants. They devour all sorts of trash, the very carcasses of beetles, toads, and snakes. On returning to my apartment, I found a little bird which I kept in a cage devoured by ants. Nor do they abstain from the bodies of sleeping persons. In the dead of the night an army of ants will issue from the wall or pavement, get upon the bed, and unless you instantly make your escape, sting you all over. This happen so frequently in the Guarany colonies, that we were obliged to burn a candle at night; for lighted sheets of paper thrown upon the swarm are the only means of driving them away. The Portuguese have an old saying, that the ants are queens of Brazil. Certainly we have found them the sovereigns of Paraguay. There may be said to be more trouble in conquering these insects, than all the savages put together; for every contrivance hitherto devised serves only to put them to flight, not banish them effectually."

THE MOST ANCIENT DESCRIPTION OF VIRGINIA.

Extracted from "The Trve Travels, Adventvres and Observations of Captaine Iohn Smith, in Europe, Asia, Africke, and America." Published London 1629.

The Sixt Voyage, 1606. *to another part of Virginia, where now are planted our English Colonies, whom God increase and preserue: Discovered and described by Captaine Ihon Smith, sometimes Governour of the Countrey.*

By these former relations you may see what inconveniences still crossed those good intents, and how great a matter it was all this time to finde but a harbour, although there be so many. But this Virginia is a country in America betweene the degrees of 34. and 45. of the North latitude. The bounds thereof on the east side are the great ocean: on the south lyeth Florida: on the north Nova Francia: as for the west thereof, the limits are vnknowne. Of all this country we purpose not to speake, but onely of that part which was planted by the English men, in the yeare of our Lord, 1606. And this is vnder the degrees 37. 38. and 39. The temperature of this country doth agree well with English constitutions, being once seasoned to the country. Which appeared by this, that though by many occasions our people fell sicke; yet did they recover by very small meanes, and continued in health, though there were other great causes, not onely to haue made them sicke, but even to end their dayes, &c.

The sommer is hot as in Spaine; the winter cold as in France or England. The heat of sommer is in Iune, Iuly, and August, but commonly the coole breeses asswage the vehemency of the heat. The chiefe of winter is halfe December, Ianuary, February, and halfe March. The colde is extreame sharpe, but here the proverbe is true, that no extreame long continueth.

In the yeare 1607, was an extraordinary frost in most of Europe, and this frost was found as extreame in Virginia. But the next yeare for 8 or 10 dayes of ill weather, other 14 dayes would be as sommer.

The windes here are variable, but the like thunder and lightning to purifie the ayre, I haue seldome either seene or heard in Europe. From the southwest came the greatest gusts with thunder and heat. The northwest winde is commonly coole and bringeth faire weather with it. From the north is the greatest cold, and from the east and southeast as from the Bermudas, fogs and raines.

Sometimes there are great droughts, other times much raine, yet great necessitie of neither, by reason we see not but that all the raritie of needful fruits in Europe, may be there in great plentie, by the industry of men, as appeareth by those we there planted.

There is but one entrance by sea into this country, and that is at the mouth of a very goodly bay, 18 or 20 myles broad. The cape on the south is called Cape Henry, in honour of our most noble Prince. The land white hilly sands like vnto the Downes, and all along the shores great plentie of pines and firres.

The north Cape is called Cape Charles, in honour of the noble Duke of Yorke. The Isles before it, Smith's Isles, by the name of the discoverer. Within is a country that may haue the prerogatiue over the most pleasant places knowne, for large and pleasant navigable rivers: heaven and earth never agreed better to frame a place for mans habitation, were it fully manured and inhabited by industrious people. Here are mountaines, hils, plaines, valleyes, rivers and brookes, all running most pleasantly into a faire bay, compassed, but for the mouth, with fruitfull and delightsome land. In the bay and rivers are many isles both great and small, some woody, some plaine, most of them low and not inhabited. This bay lyeth north and south, in which the water floweth neare 200 myles and hath a channell, for 140 myles, of depth betwixt 6 and 15 fadome, holding a breadth for the most part 10 or 14 myles. From the head of the bay to the northwest, the land is mountanous, and so in a manner from thence by a southwest line;

so that the more southward, the farther off from the bay are those mountaines. From which fall certaine brookes which after come to fiue principall navigable rivers. These run from the northwest into the southeast, and so into the west side of the bay, where the fall of every river is within 20 or 15 myles one of the other.

The mountaines are of divers natures: for at the head of the bay the rockes are of a composition like mill stones. Some of marble, &c. And many peeces like christall we found, as throwne downe by water from those mountaines. For in winter they are covered with much snow, and when it dissolveth, the waters fall with such violence, that it causeth great inundations in some narrow valleys, which is scarce perceived being once in the rivers. These waters wash from the rocks such glistering tinctures, that the ground in some places seemeth as guilded, where both the rocks and the earth are so splendent to behold, that better iudgements then ours might haue beene perswaded, they contained more then probabilities. The vesture of the earth in most places doth manifestly proue the nature of the soyle to be lusty and very rich. The colour of the earth we found in diverse places, resembleth *bole armoniac*, *terra a sigillata*, and *Lemnia*, Fullers earth, marle, and divers and other such appearances. But generally for the most part it is a blacke sandy mould, in some places a fat slimy clay, in other places a very barren gravell. But the best ground is knowne by the vesture it beareth, as by the greatnesse of trees, or abundance of weeds, &c.

The country is not mountanous, nor yet low, but such pleasant plaine hils, and fertile valleyes, one prettily crossing another, and watered so conveniently with fresh brookes and springs, no lesse commodious, then delightsome. By the rivers are many plaine marishes, containing some 20, some 100, some 200 acres, some more, some lesse. Other plaines there are few, but onely where the salvages inhabit: but all overgrowne with trees and weeds, being a plaine wildernesse as God first made it.

On the west side of the bay, we sayd were 5 faire and delightfull navigable rivers. The first of those, and the next to the mouth of the bay hath his course from the west northwest. It is called Powhatan, according to the name of a principall countrey that lyeth vpon it. The mouth of this river is neare three myles in breadth, yet doe the shoules force the channell so neare the land, that a sarce will overshoot it at point blancke. It is navigable 150 myles, the shoules and soundings are here needlesse to be expressed. It falleth from rockes farre west in a country inhabited by a nation they call Monacans. But where it commeth into our discovery it is Powhatan. In the farthest place that was diligently observed, are falles, rockes, shoules, &c., which makes it past navigation any higher. Thence in the running downeward, the river is enriched with many goodly brookes, which are maintained by an infinit number of small rundles and pleasant springs that disperse themselues for the best service, as do the veines of a mans body. From the South there fals into it, first, the pleasant river of Apamatuck. Next more to the east are two small rivers of Quiyoughcohanocke. A little farther is a bay wherein falleth 3 or 4 prettie brookes and creekes that halfe intrench the inhabitants of Warraskoyac, then the river of Nansamund, and lastly the brooke of Chisapeack. From the north side is the river of Chickahamania, the backe river of Iames Town; another by the Cedar Isle, where we liued ten weekes vpon oysters, then a convenient harbour for fisher boats at Kecoughtan, that so turneth it selfe into bayes and creekes, it makes that place very pleasant to inhabit; their cornefields being girded therein in a manner as peninsulaes. The most of these rivers are inhabited by severall nations, or rather families, of the name of the rivers. They haue also over those some Governour, as their King, which they call Werowances. In a peninsula on the north side of this river are the English planted in a place by them called Iames Towne, in honour of the Kings most excellent Maiestie.

The first and next the rivers mouth are the Kecoughtans, who besides their women and children, haue not past 20 fighting men. The Paspaheghes (on whose land is seated Iames Towne, some 40 myles from the Bay) haue not past 40. The river called Chickahamania neare 250. The Weanocks 100. The Arrowhatocks 30. The place called Powhatan, some 40. On the south side this river the Appamatucks haue sixtie fighting men. The Quiyougcohanocks 25. The Nansamunds 200. The Chesapeacks 100. Of this last place the bay beareth the name. In all these places is a severall commander, which they call Werowance, except the Chickahamanians, who are governed by the priests and their assistants, or their elders called Caw-cawwassoughes. In sommer no place affordeth more plentie of sturgeon, nor in winter more abundance of foule, especially in the time of frost. I tooke once 52 sturgeons at a draught, at another 68. From the later end of May till the end of Iune are taken few, but yong sturgeons of two foot, or a yard long. From thence till the midst of September, them of two or three yards long and few others. And in 4 or 5 houres with one net were ordinarily taken 7 or 8; often more, seldome lesse. In the small rivers all the yeare there is good plentie of small fish, so that with hookes those that would take paines had sufficient.

Foureteene myles northward from the river Powhatan, is the river Pamavnkee, which is navigable 60 or 70 myles, but with catches and small barkes 30 or 40 myles farther. At the ordinary flowing of the salt water, it divideth it self into two gallant branches. On the south side inhabit the people of Youghtanund, who haue about 60 men for warres. On the north branch Mattapament, who haue 30 men. Where this river is divided, the country is called Pamavnkee and nourisheth neare 300 able men. About 25 myles lower on the north side of this river is Werawocomoco, where their great king inhabited when I was delivered him prisoner; yet there are not past 40 able men. Ten or twelue myles lower, on the south side of this river, is Chiskiack, which hath some 40 or 50 men. These, as also Apamatuck, Irrohatock, and Powhatan, are their great kings chiefe alliance, and inhabitants. The rest his conquests.

Before we come to the third river that falleth from the mountaines, there is another river (some 30 myles navigable) that commeth from the inland, called Payankatanke: the inhabitants are about 50 or 50 serviceable men.

The third navigable river is called Toppahanock. (This is navigable some 130 myles.) At the top of it inhabit the people called Mannahoacks amongst the mountaines, but they are aboue the place we described. Vpon this river on the north side are the people Cuttatawomen, with 30 fighting men. Higher are the Moraughtacunds, with 80. Beyond them Rapahanock with 100. Far aboue is another Cuttatawomen with 20. On the south is the pleasant seat of Nantaughtacund having 150 men. This river also, as the two former, is replenished with fish and foule.

The fourth river is called Patawomeke, 6 or 7 myles in breadth. It is navigable 140 myles, and fed as the rest with many sweet rivers and springs, which fall from the bordering hils. These hils many of them are planted, and yeeld no lesse plentie and varietie of fruit, then the river exceedeth with abundance of fish. It is inhabited on both sides. First on the south side at the very entrance is Wighcocomoco, and hath some 130 men, beyond them Sekacawone with 30. The Onawmanient with 100. And the Patawomekes more then 200. Here doth the river divide it selfe into 3 or 4 convenient branches. The greatest of the least is called Quiyough, trending northwest, but the river it selfe turneth northeast, and is still a navigable streame. On the westerne side of this bought is Tauxenent with 40 men. On the north of this river is Secowocomoco with 40. Somewhat further Potapaco with 20. In the east part is Pamacaeack with 60. After Moyowance with 100. And lastly, Nocotchtanke with 80. The river aboue this place maketh his passage downe a low pleasant valley overshaddowed in many places with high rocky mountaines; from whence distill innumerable sweet and pleasant springs.

The fift river is called Pawtuxunt, of a lesse proportion then rest; but the channell is 16 fadome deepe in some places. Here are infinit skuls of divers kindes of fish more then elsewhere. Vpon this river dwell the people called Acquintanacksuak, Pawtuxunt, and Mattapanient. Two hundred men was the greatest strength that could be there perceived. But they inhabit together, and not so dispersed as the rest. These of all other we found most civill to giue intertainement.

Thirtie leagues northward is a river not inhabited, yet navigable; for the red clay resembling *bole Armoniack* we called it *Bolus*. At the end of the Bay where it is 6 or 7 myles in breadth, it divides it selfe into 4 branches, the best commeth northwest from among the mountaines, but though canows may goe a dayes iourney or two vp it, we could not get two myles vp it with our boat for rockes. Vpon it is seated the Sasquesahanocks: neare it north and by west runneth a creeke a myle and a halfe: at the head whereof the ebbe left vs on shore, where we found many trees cut with hatchets. The next tyde keeping the shore to seeke for some salvages, (for within thirtie leagues sayling, we saw not any, being a barren country,) we went vp another small river like a creeke 6 or 7 myle. From thence returning we met 7 canowes of the Massowomeks, with whom we had conference by signes, for we vnderstood one another scarce a word: the next day we discovered the small river and people of Tockwhogh trending eastward.

Having lost our grapnell among the rocks of Sasquesahanocks, we were then neare 200 myles from home, and our barge about two tuns, and had in it but twelve men to performe this discovery, wherein we lay about 12 weekes vpon those great waters in those vnknowne countries, having nothing but a little meale, oatemeale and water to feed vs, and scarce halfe sufficient of that for halfe that time, but what provision we got among the salvages, and such rootes and fish as we caught by accident, and Gods direction; nor had we a mariner nor any had skill to trim the sayles but two saylers and my selfe, the rest being gentlemen, or them were as ignorant in such toyle and labour. Yet necessitie in a short time, by good words and examples, made them doe that that caused them ever after to feare no colours. What I did with this small meanes I leaue to the reader to iudge, and the mappe I made of the country, which is but a small matter in regard of the magnitude thereof. But to proceed, 60 of those Sasquesahanocks came to vs with skins, bowes, arrows, targets, beads, swords and tobacco pipes for presents. Such great and well proportioned men are seldome seene, for they seemed like giants to the English, yea and to the neighbours, yet seemed of an honest and simple disposition, with much adoe restrained from adoring vs as Gods. Those are the strangest people of all those countries, both in language and attire; for their language it may well beseeme their proportions, sounding from them, as a voyce in a vault. Their attire is the skinnes of beares and woolues; some haue cassacks made of beares heads and skinnes, that a mans head goes through the skinnes neck, and the eares of the beare fastened to his shoulders, the nose and teeth hanging downe his breast, another beares face split behind him, and at the end of the nose hung a pawe, the halfe sleeues comming to the elbowes were the neckes of beares, and the armes through the mouth with pawes hanging at their noses. One had the head of a wolfe hanging in a chaine for a jewell, his tobacco pipe three quarters of a yard long, prettily carued with a bird, a deere, or some such devise at the great end, sufficient to beat out ones braines: with bowes, arrowes, and clubs, sutable to their greatnesse. These are scarce knowne to Powhatan. They can make neare 600 able men, and are pallisadoed in their townes to defend them from the Massawomekes their mortall enemies. Fiue of their chiefe Werowances came aboord vs and crossed the bay in their barge. The picture of the greatest of them is signified in the mappe; the calfe of whose leg was three quarters of a yard about, and all the rest of his limbes so answerable to that proportion, that he seemed the goodliest man we ever beheld. His hayre, the one side was long, the other shore close with a ridge over his crowne like a cocks combe. His arrowes were fiue quarters long, headed with the splinters of a white christall-like stone, in forme of a heart, an inch broad, and an inch and a halfe or more long. These he wore in a woolues skinne at his backe for his quiver, his bow in the one hand and his clubbe in the other, as is described.

On the east side the bay, is the river Tockwhogh, and vpon it a people that can make 100 men, seated some seaven myles within the river: where they haue a fort very well pallisadoed and mantelled with barkes of trees. Next them is Ozinies with sixty men. More to the south of that east side of the bay, the river Rapahanock, neere vnto which is the river Kuscarawaock. Vpon which is seated a people with 200 men. After that, is the river Tants Wighcocomico, and on it a people with 100 men. The people of those rivers are of little stature, of another language from the rest, and very rude. But they on the river Acohanock with 40 men, and they of Accomack 80 men, doth equalize any of the territories of Powhatan, and speake his language, who over all those doth rule as king.

Southward we went to some parts of Chawonock and the Mangoags to search for them left by Mr. White. Amongst those people are thus many severall nations of sundry languages, that environ Powhatans territories. The Chawonockes, the Mangoags, the Monacans, the Mannahokes, the Masawomekes, the Powhatans, the Sasquesahanocks, the Atquanachukes, the Tockwoghes, and the Kuscarawaockes. All those not any one vnderstandeth another but by interpreters. Their severall habitations are more plainly described by this annexed mappe, which will present to the eye, the way of the mountaines, and current of the rivers, with their severall turnings, bayes, shoules, isles, inlets, and creekes, the breadth of the waters, the distances of places, and such like. In which mappe obserue this, that as far as you see the little crosses on rivers, mountaines, or other places haue beene discovered; the rest was had by information of the salvages, and are set downe according to their instructions.

Thus haue I walkt a wayless way, with vncouth pace.
Which yet no christian man did ever trace:
But yet I know this not affects the minde,
Which eares doth heare; as that which eyes doe finde.

Of such things which are naturally in Virginia, and how they vse them.

Virginia doth afford many excellent vegetables, and liuing creatures, yet grasse there is little or none, but what groweth in low marishes: for all the countrey is overgrowne with trees, whose droppings continually turneth their grasse to weeds, by reason of the rancknes of the ground, which would soone be amended by good husbandry. The wood that is most common is oke and walnut; many of their okes are so tall and straight, that they will beare two foote and a halfe square of good timber for 20 yards long. Of this wood there is two or three severall kinds. The acornes of one kinde, whose barke is more white then the other, and somewhat sweetish, which being boyled, at last affords a sweet oyle, that they keepe in gourds to annoint their heads and ioynts. The fruit they eate made in bread or otherwise. There is also some elme, some blacke walnut tree, and some ash: of ash and elme they make sope ashes. If the trees be very great, the ashes will be good, and melt to hard lumps, but if they be small, it will be but powder, and not so good as the other. Of walnuts there is 2 or 3 kindes; there is a kinde of wood we called cypres, because both the wood, the fruit, and leafe did most resemble it, and of those trees there are some neare three fadome about at the foot, very straight, and 50, 60, or 80 foot without a branch. By the dwelling of the salvages are some great mulbery trees, and in some parts of the countrey they are found growing naturally in prettie groues. There was an assay made to make silke, and surely the wormes prospered excellent well, till the master workeman fell sicke; during which time they were eaten with rats.

In some parts were found some chesnuts whose wild fruit equalize the best in France, Spaine, Germany, or Italy. Plums there are of three sorts. The red and white are like our hedge plums, but the other, which they call *putchamins*,* grow as high as a palmeta: the fruit is like a medler; it is first greene, then yellow, and red when it is ripe; if it be not ripe, it will draw a mans mouth awry, with much torment, but when it is ripe it is as delicious as an apricot.

They haue cherries, and those are much like a damson, but for their tastes and colour we called them cherries. We saw some few crabs, but very small and bitter. Of vines great abundance in many parts that climbe the toppes of highest trees in some places, but these beare but few grapes. Except by the rivers and salvage habitations, where they are not overshadowed from the sunne, they are covered with fruit, though never pruined nor manured. Of those hedge grapes we made neere twentie gallons of wine, which was like our French Brittish wine, but certainly they would proue good were they well manured. There is another sort of grape neere as great as a cherry, this they call *messamins*, they be fatte, *and* the iuyce thicke. Neither doth the taste so well please when they are made in wine. They haue a small fruit growing on little trees, husked like a chesnut, but the fruit most like a very small acorne. This they call *chechinquamins*, which they esteeme a great daintie. They haue a berry much like our gooseberry, in greatnesse, colour, and tast; those they call rawcomens, and doe eat them raw or boyled. Of these naturall fruits they liue a great part of the yeare, which they vse in this manner: the walnuts, chesnuts, acornes, and *chechinquamins* are dryed to keepe. When they need walnuts they breake them between two stones, yet some part of the shels will cleaue to the fruit. Then doe they dry them againe vpon a mat over a hurdle. After they put it into a morter of wood, and beat it very small: that done, they mixt it with water, that the shels may sinke to the bottome. This water will be coloured as milke, which they call *pawcohiccora*, and keepe it for their vse. The fruit like medlers they call putchamins, they cast vpon hurdles on a mat, and preserue them as pruines. Of their chesnuts and chechinquamins boyled, they make both broath and bread for their chiefe men, or at their greatest feasts. Besides those fruit trees, there is a white popular, and anather tree like vnto it, that yeeldeth a very cleare and an odoriferous gumme like turpentine, which some called balsom. There are also cedars and saxafras trees. They also yeeld gummes in a small proportion of themselues. Wee tryed conclusions to extract it out of the wood, but nature afforded more then our arts.

In the watry valleyes groweth a berry which they call *ocoughtanamnis* very much like vnto capers. These they dry in sommer. When they eat them they boile them neare halfe a day; for otherwise they differ not much from poyson. *Mattoum* groweth as our bents. The seed is not much vnlike to rie, though much smaller. This they vse for a daintie bread buttered with deare suet.

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* Persimmons. Ed.

During sommer there are either strawberries, which ripen in Aprill, or mulberries which ripen in May and Iune. Raspises, hurts; or a fruit that the inhabitants call maracocks, which is a pleasant wholesome fruit much like a lemond. Many herbes in the spring are commonly dispersed throughout the woods, good for brothes and sallets, as violets, purslain, sorrell, &c. Besides many we vsed whose names we know not.

The chiefe root they haue for food is called **Tockawhoughe.** It groweth like a flagge in marishes. In one day a salvage will gather sufficient for a weeke. These rootes are much of the greatnesse and taste of potatoes. They vse to cover a great many of them with oke leaues and ferne, and then cover all with earth in the manner of a colepit; over it, on each side, they continue a great fire 24 houres before they dare eat it. Raw it is no better then poyson, and being rosted, except it be tender and the heat abated, or sliced and dryed in the sunne, mixed with sorrell and meale or such like, it will prickle and torment the throat extreamely, and yet in sommer they vse this ordinarily for bread.

They haue another roote which they call **Wighsacan:** as th'other feedeth the body, so this cureth their hurts and diseases. It is a small root which they bruise and apply to the wound. Pocones is a small root that groweth in the mountaines, which being dryed and beate in powder, turneth red. And this they vse for swellings, aches, annointing their ioynts, painting their heads and garments. They account it very precious, and of much worth. Musquaspen is a roote of the bignesse of a finger, and as red as bloud. In drying, it will wither almost to nothing. This they vse to paint their mattes, targets, and such like.

There is also pellitory of Spaine, sasafrage, and divers other simples, which the apothecaries gathered, and commended to be good, and medicinable.

In the low marishes grow plots of onyons, containing an acre of ground or more in many places; but they are small, not past the bignesse of the top of ones thumbe.

Of beasts the chiefe are deere, nothing differing from ours. In the deserts towards the heads of the rivers, there are many, but amongst the rivers few. There is a beast they call Aroughcun,[*] much like a badger, but vseth to liue on trees as squirrels doe. Their squirrels some are neare as great as our smallest sort of wilde rabbits, some blackish or blacke and white, but the most are gray.

A small beast they haue they call Assapanick, but we call them flying squirrels, because spreading their legs, and so stretching the largenesse of their skins, that they haue beene seene to fly 30 or 40 yards. An opossom hath a head like a swine, and a taile like a rat, and is of the bignesse of a cat. Vnder her belly shee hath a bagge, wherein she lodgeth, carrieth, and suckleth her young. A Mussascus[†] is a beast of the forme and nature of our water rats, but many of them smell exceeding strongly of muske. Their hares no bigger then our conies, and few of them to be found.

Their beares are very little in comparison of those of Muscovia and Tartaria. The beaver is as big as an ordinary water dog, but his legs exceeding short. His forefeete like a dogs, his hinder feet like a swans. His taile somewhat like the forme of a racket, bare without haire, which to eat the salvages esteeme a great delicate. They haue many otters, which as the beavers they take with snares, and esteeme the skins great ornaments, and all of those beasts they vse to feed when they catch them. An Vtchunquoyes is like a wilde cat. Their foxes are like our silver haired conies, of a small proportion, and not smelling like those in England. Their dogges of that country are like their woolues, and cannot barke, but howle, and the woolues not much bigger then our English foxes. Martins, powlecats, weesels, and minkes we know they haue, because we haue seene many of their skinnes, though very seldome any of them aliue. But one thing is strange, that we could never perceiue their vermine destroy our hennes, egges, nor chickens, nor doe any hurt, nor their flyes nor serpents any way pernicious, whereas in the south parts of America they are alwayes dangerous, and often deadly.

Of birds the eagle is the greatest devourer. Hawkes there be of divers sorts, as our falconers called them: sparrow-hawkes, lanarets, goshawkes, falcons, and osperayes, but they all prey most vpon fish. Their partridges are little bigger than our quailes. Wilde turkies are as bigge as our tame. There are woosels or blackbirds with red shoulders, thrushers and divers sorts of small birds, some red, some blew, scarce so bigg as a wrenne, but few in sommer. In winter there are great plentie of swans, cranes, gray and white with blacke wings, herons, geese, brants, ducke, wigeon, dotterell, oxeics, parrats, and pigeons. Of all those sorts great abundance, and some other strange kinds, to vs vnknowne by name. But in sommer not any, or a very few to be seene.

Of fish we were best acquainted with sturgeon, grampus, porpus, seales, stingraies, whose tailes are very dangerous. Bretts, mullets, white salmonds, trowts, soles, plaice, herrings, conyfish, rockfish, eeles, lampreys, catfish, shades, pearch of three sorts, crabs, shrimps, crevises, oysters, cocles, and muscles. But the most strange fish is a small one, so like the picture of St George his dragon, as possible can be, except his legs and wings, and the toadfish, which will swell till it be like to burst, when it commeth into the ayre.

Concerning the entrailes of the earth, little can be said for certaintie. There wanted good refiners; for those that tooke vpon them to haue skill this way, tooke up the washings from the mountaines, and some moskered shining stones and spangles which the waters brought downe, flattering themselues in their owne vaine conceits to haue beene supposed what they were not, by the meanes of that ore, if it proued as their arts and iudgments expected. Onely this is certaine, that many regions lying in the same latitude, afford mines very rich of divers natures. The crust also of these rocks would easily perswade a man to beleeue there are other mines then yron and steelle, if there were but meanes and men of experience that knew the mine from spar.

Of their planted fruits in Virginia, *and how they vse them.*

They divide the yeare into fiue seasons. Their winter some call, popanow, the spring, cattapeuk, the sommer, cohattayough, the earing of their corne, nepinough, the harvest and fall of leafe, taquitock. From September vntill the midst of November are the chiefe feasts and sacrifice. Then haue they plentie of fruits as well planted as naturall, as corne, greene and ripe, fish, fowle, and wilde beasts exceeding fat.

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[*] Rackoon.—Ed.

[†] Muskrat.—Ed.

The greatest labour they take, is in planting their corne, for the country naturally is overgrowne with wood. To prepare the ground they bruise the barke of the trees neare the root, then doe they scortch the roots with fire that they grow no more. The next yeare with a crooked peece of wood they beat vp the weeds by the rootes, and in that mould they plant their corne. Their manner is this. They make a hole in the earth with a sticke, and into it they put foure graines of wheate* and two of beanes. These holes they make foure foote one from another; their women and children do continually keepe it with weeding, and when it is growne middle high, they hill it about like a hop-yard.

In April they begin to plant, but their chiefe plantation is in May, and so they continue till the midst of Iune. What they plant in April they reape in August; for May in September, for Iune in October: every stalke of their corne commonly beareth two eares, some three, seldome any foure, many but one, and some none, Every eare ordinarily hath betwixt 200 and 500 graines. The stalke being greene hath a sweet iuice in it, somewhat like a sugar cane, which is the cause that when they gather their corne greene, they sucke the stalkes: for as we gather greene pease, so doe they their corne being greene, which excelleth their old. They plant also pease they call Assentamens, which are the same they call in Italy, Fagioli. Their beanes are the same the Turkes call garnanses, but these they much esteeme for dainties.

Their corne they rost in the eare greene, and bruising it in morter of wood with a polt, lap it in rowles in the leaues of their corne, and so boyle it for a daintie. They also reserue that corne late planted that will not ripe, by roasting it in hot ashes, the heat thereof drying it. In winter they esteeme it being boyled with beanes for a rare dish, they call pausarowmena. Their old wheat they first steepe a night in hot water, in the morning pounding it in a mortar. They vse a small basket for their temmes, then pound againe the great, and so separating by dashing their hand in the basket, receiue the flower in a platter made of wood, scraped to that forme with burning and shels. Tempering this flower with water, they make it either in cakes, covering them with ashes till they be baked, and then washing them in faire water, they drie presently with their owne heat: or else boyle them in water, eating the broth with the bread, which they call ponap. The groutes and peeces of the cornes remaining, by fanning in a platter or in the wind, away the branne, they boyle three or four houres with water, which is an ordinary food they call vstatahamen.† But some more thriftie then cleanly, doe burne the corne of the eare to powder, which they call pungnough, mingling that in their meale, but it never tasted well in bread, nor broth. Their fish and flesh they boyle either very tenderly, or boyle it so long on hurdles over the fire, or else after the Spanish fashion, putting it on a spit, they turne first the one side, then the other, till it be as drie as their ierkin beefe in the West Indies, that they may keepe it a moneth or more without putrifying. The broth of fish or flesh they eat as commonly as the meat.

In May also amongst their corne they plant pumpeons, and a fruit like vnto a muske mellon, but lesse and worse, which they call macocks. These increase exceedingly, and ripen in the beginning of Iuly, and continue vntil September, They plant also maracocks, a wild fruit like a lemmon, which also increase infinitely. They begin to ripe in September, and continue until the end of October, when all their fruits be gathered. Little els they plant, and this is done by their women and children; neither doth this long suffice them, for neare three parts of the yeare, they onely obserue times and seasons, and liue of what the country naturally affordeth from hand to mouth, &c.

The Commodities in Virginia, or that may be had by Industrie.

The mildness of the ayre, the fertilitie of the soyle, and situation of the rivers are so propitious to the nature and vse of man, as no place is more convenient for pleasure, profit, and mans sustenance, vnder that latitude or climat. Here will liue any beasts, as horses, goats, sheepe, asses, hens, &c. as appeared by them that were carried thether. The waters, isles, and shoales, are full of safe harbours for ships of warre or merchandize, for boats of all sorts, for transportation or fishing, &c. The bay and riuers have much marchantable fish, and places fit for salt coats, building of ships, making of iron, &c.

Muscovia and Polonia doe yearly receiue many thousands, for pitch, tarre, soap-ashes, rosen, flax, cordage, sturgeon, masts, yards, wainscot, firres, glasse, and such like; also Swethland for iron and copper. France in like manner, for wine, canvas and salt. Spaine as much for iron, steele, figges, reasons, and sackes. Italy with silkes and velvets consumes our chiefe commodities. Holland maintaines it selfe by fishing and trading at our owne doores. All these temporize with other for necessities, but all as vncertaine as peace or warres. Besides the charge, travell, and danger in transporting them, by seas, lands, stormes, and pyrats. Then how much hath Virginia the prerogatiue of all those flourishing kingdomes, for the benefit of our land, when as within one hundred myles all those are to be had, either ready provided by nature, or else to be prepared, were there but industrious men to labour. Onely of copper we may doubt is wanting, but there is good probabilitie that both copper and better minerals are there to be had for their labour. Other countries haue it. So then there is a place, a nurse for souldiers, a practise for mariners, a trade for marchants, a reward for the good, and that which is most of all, a businesse (most acceptable to God) to bring such poore infidels to the knowledge of God and his holy gospell.

PAPER VENEERING.

We yesterday examined an elegant piece of furniture veneered with marble paper, in imitation of rose wood. The imitation was so perfect and the veneering so exact, that an experienced painter was unable to discover that it was not grained with paint, though he considered it almost impossible to shade and blend colors in such a beautiful manner. The paper was from the manufactory of Messrs. S. C. & E. Mann, of this town. They have brought the manufacture of colored marble paper to a higher state of perfection than any establishment in the United States. This plan of veneering furniture, we think, will prove a very useful improvement. It combines three very desirable qualities—elegance, durability and cheapness. A common pine table can be covered, in imitation of rose wood, for $1 50, in a style that would defy the most skilful painter in the world to equal. It is the opinion of cabinet makers that it will wear much longer than common veneering. A piece of furniture finished in this style may be examined at the Norfolk Bookstore in a few days. —*Dedham Patriot.*

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* Indian Corn.—Ed. † Hominy.—Ed.

CURE FOR BLIGHT OF PEAR TREES.

The disease, termed blight, which six or eight years ago, as also in 1802 to 1808, destroyed many of our pear trees, is again, we learn, making its appearance. We have been of opinion that the evil arises from a minute insect, which preys upon the inner bark. An insect of this kind, almost imperceptible to the naked eye, has been known to destroy forests of the larch in Germany. Our opinion has been much strengthened by a conversation with Aaron Thorp, Esq., who finding his trees affected, has made trial of various applications, without success, until he has found, he thinks, an effectual cure, in spirits of turpentine. He applies it on and about the diseased part, in its unadulterated state, with a brush.—*N. E. Farm.*

DEMAND FOR RAIL ROAD IRON.

Bills have been obtained this session of Parliament for nearly 1100 miles of road, which will require for rails, chairs, carriages and other works, at least 220,000 tons of iron, independent of the iron wanted for roads, for which bills had been previously obtained, and which are now in active preparation, which will require about 70,000 tons, making a total of about 290,000, which will probably be supplied in the next four years. To this must be added what will be required for several very extensive ones which are now in course of survey, and for which bills will be solicited in the next session of Parliament. When the iron required for rail roads in this country is added to what will be required for rail roads now in actual progress in the United States, and on the continent of Europe, we think the iron masters of this country may fairly look forward to a greatly increased demand for their produce during the next few years.—*English Paper.*

NEW DISCOVERY.

We have seen this week at Leeds, a specimen of bleached flax, prepared by Mr. Harwood, a chemist, of York, which appears to us as presenting a decided improvement in the manufacture of that article. It has created a great sensation amongst the manufacturers, and has been taken for silk. It is capable of being manufactured into the finest thread for the construction of veils, lace, cambric, and will supersede those articles of French manufacture. The texture is most beautiful—we never saw anything equal to it; and we have no doubt that, if properly brought into notice, the discovery will prove a national benefit, and introduce quite a revolution in those articles of trade.—*Doncaster (Eng.) Chronicle.*

THE MANUFACTURE OF SILK.

A very important improvement has been made in the silk-loom at Manchester, which is likely to operate very favorably upon the manufacture of this valuable article of trade, and may be the means of transferring a very large portion of it from France and Italy to this country. It is now perfectly clear that steam power may be applied with the greatest advantage to the silk loom, which has heretofore been worked by hand only; and a young girl may weave, with this improvement, as much silk in a day as can be woven by two men upon the present plan. The new loom occupies but little more than half the space required by the one in common use, as all the apparatus connected with the weights is removed, and a spring substituted, which performs the work with much greater precision than can be wrought by weights.—*Eng. Paper.*

REPORT ON THE NAVIGATION OF THE ROANOKE.

September 15, 1836.

At a meeting of the citizens of Clarksville, held this day, Dr. S. H. Harris was called to the Chair, and Mr. N. C. Read appointed Secretary.

Mr. Tucker Carrington, who had been appointed, at a previous meeting to examine the Connecticut and other rivers in the north, for the purpose of ascertaining the probable practicability of successful steamboat navigation on the Roanoke, Dan, and Staunton Rivers, submitted his report.

After the report was read, on motion, it was resolved, that Mr. Carrington be requested to furnish a copy of his report, and that it be forwarded to the editor of the Farmer's Register, with a request that he would publish it in his paper.

On motion, it was resolved, that the citizens of Clarksville, tender their thanks to Mr. Carrington for the prompt and able manner in which he has discharged the duties assigned him.

S. H. Harris, *Chairman.*
N. C. Read, *Secretary.*

REPORT.

'The subject of attempting to navigate the Roanoke with steamboats of shallow draught, having been brought before the Board of Directors of the Roanoke Navigation Company, at their last spring's meeting, by a delegation of the citizens of Clarksville—that board very promptly responded to the application, by ordering an engineer to be employed, who should examine the river, with a view to the practicability of effecting this important object, and report to them at the meeting of the directors in November ensuing. In addition to this highly important step, they appointed one of the members of their own body, (Mr. E. B. Hicks of Brunswick,) to visit the northern rivers, where it was understood these boats on shallow and swift water were in successful operation, to make such examinations, and collect such information, as would better enable them to move in this interesting enterprise. That gentleman addressed a letter to some of the citizens of Clarksville, suggesting the importance of appointing some one from that place, to accompany and aid him in the laborious work assigned him. The meeting which was called on that occasion, resulted in the passage of a unanimous resolution that the appointment be made, and that appointment fell on myself. We set out about the middle of June last, and reached the City of Washington a short time before the adjournment of Congress; there sought and procured an acquaintance with the members from the states of Massachusetts and Connecticut, and from them, obtained letters of introduction to all such persons, on the line of our contemplated travel, as would be likely to afford us any aid in the business with which we were charged. Thus prepared, we left Washington; and in a few days we were on the banks of the Connecticut River, which, we were informed, offered the best means of information on this subject, and which we determined to make the scene of our examinations and investigations. My friend, Mr. Hicks, has done no more than justice to the gentlemen whose names he has introduced, in terms of compliment, in a report lately addressed, by him, to the Superintendent of the Roanoke Navigation Company on this subject. They received us not only as fellow-citizens of the same country and government, but with that liberal spirit of patriotism, and extended usefulness, which seeks to shed upon others those high advantages, and superior lights, which themselves possessed. And although every man seems to have his business and employment, yet every thing was made subordinate to the duty of affording us that attention which, as strangers, and that aid which as explorers, we so much needed. In fact, we too little know, and too little appreciate our Yankee brethren.

On reaching Hartford, where the use of steamboats of light draught commences, we determined to remain a few days, and collect, from conversation with the intelligent men of the place, all the information and important facts we could. Here we made the acquaintance of Alfred Smith, Esq. President of the Connecticut Navigation Company, and who personally superintended and aided in the surveys of that river, and all the works upon it. Alfred Smith is a man of clear strong head, of a reflecting and investigating cast of mind, and well stored with that sort of information, which such a mind is apt to acquire—with feelings which at the same time they do not hurry him into the incautious extravagance of the enthusiast, yet do not suffer him to linger far in rear of the spirit of the age in which he lives. With a character stainless and irreproachable, he deservedly stands high in the confidence of his countrymen. From such a source, we could not fail to learn much that was valuable, and entirely to be relied upon. From him, we obtained all the information which could be had from mere conversation, and much to aid and guide us in our subsequent examinations. From Hartford to Springfield, a distance of 26 miles, the steamboat Massachusetts, of 35 horse power, daily plies each way; descending in the morning from Springfield to Hartford, and returning in the evening to the former place. It was built by Thos. Blanchard, about 4 years ago, at his own individual risk; so little sanguine were his fellow-citizens of his success, that few or none would join him. The two great objects to be obtained, in order to secure success, are the procurement of great power and shallow draught; for where the water is rapid and calls for power in the boat to ascend it, it is usually shoaly and must have a shallow float in order to pass without hanging. In the building of craft of every description, the hull is generally made of strong, heavy timbers, it being the foundation upon which all the superstructure rests, and by which it is supported: and of necessity, if the vessel be of much burden, must sink deep in the water. But in the boat Massachusetts, a skill in construction and design is displayed, which secures a good burden, without forfeiting the light draught. It is built upon the principle of a suspended bridge, in which two strong arches or circles of oak timber are thrown over, and the decks, cabins, and hull, hang beautifully and successfully upon it; and thus all the under-works, being supported, and not supporting, can be made very light and thin, and secures to the boat a very shallow draught. This is a design, for which Mr. Blanchard has procured a patent; and to show that no strength in the boat is forfeited by this construction, it is only necessary to mention, that it has been running over rocks, sands and rapids, for four years, with great profit to the owners, without one dollar being necessary for repairs. This boat is upon the high pressure principle, 97½ feet long, 13½ wide, and draws 22 inches water with a freight of from 40 to 50 passengers, and their baggage. Its travel being entirely by day light, there are no accommodations for lodging; but two quite spacious cabins, one for ladies, and one for gentlemen, and an upper deck, where passengers either sit or promenade at pleasure. The wheel is in the stern; one having been tried with wheels on the sides, and found not to answer, on account of the narrow passes between the rocks, which broke and displaced the paddles. The cost of the above boat, was $7000, and the charge for crew per month, was $100; fuel would add something to the expense, but nothing material. Its gross income is from $75 to $100 per day, and of course it is first rate property, as well as a great public convenience.

Having thus given some description of the plan and principle upon which the boat is constructed, it follows in order to give some account of the water upon which it is used, to enable you to form an opinion as to the possibility of applying such boats to any practical purposes on the Roanoke, Dan, and Staunton. Steamboats which have sufficient size to encounter, with ease and safety, the swells and storms of Long Island Sound, come without difficulty to Hartford. From Hartford up, the navigation is much interrupted by falls, shallows, and shifting bars of sand, which entirely forbid the ascent of boats of such burden as are used below. The distance from Hartford to the foot of Enfield Falls is 12 miles, and in all this stretch, the river is smooth and gentle in its current, with not more than three inches fall to the mile. From the head of the same fall, to Springfield, a distance of nine miles, the current again becomes smooth, and unbroken by impediments of any kind, with about the same fall as below the rapids above mentioned. Enfield Falls, which lie opposite the little village of Enfield, and hence derive the name, are from 5 to 5½ miles from foot to head; but there being 1¼ of slack water between the upper and lower fall, the rapid water is 3½ miles in extent. This fall is 10 feet to the mile, by actual measurement. To the eye, this fall is remarkably well distributed; but is said to consist of a succession of pitches or strains, at different intervals and of different strength, and to all of which, as with us, the boatmen have given some name, as Mad Tom, &c. Over this fall the steamboat Massachusetts passes with the greatest ease, —shifting its direction frequently across the current, to avoid the rocks and bars which make their position known to the practised eye of the pilot by signs on the surface—in 1 hour and 15 minutes. The rocks and sand in the bottom of the river, are visible from the deck of the boat in nearly the entire extent of the fall, and in many places the stream becomes so shallow, that the smallest pebble may be seen with the utmost distinctness. The velocity of the water on Enfield Falls having been ascertained by Mr. Blanchard, by actual measurement, to be between 8 and 9 miles an hour, he came to the conclusion, that a supervening power of 12 miles an hour (which is the power of the steamer Massachusetts upon water at rest,) would overcome it at the rate of 3 miles an hour. His experiment has demonstrated the correctness of his reasoning, and displayed a triumph of genius and art over the obstacles of nature. In descending, little or no steam is used: the progress of the boat on the falls, being as rapid without it, as is consistent with safety and accurate steering, for which purpose a long bow-oar is employed, which perfectly commands the direction of the boat.

I will now proceed to compare the obstacles, which have been overcome by the power of steam on the Connecticut River, and the difficulties to be surmounted in the Roanoke, in order to have the same success. It is unnecessary for me to go very minutely into details on this important branch of the subject. The statistics on this point, have been so clearly set forth in the report of E. B. Hicks, Esq. to the Superintendent of the Roanoke Navigation Company, published in the August No. of the Farmers' Register, and the encouraging fact, that success is within our reach, so clearly derivable from the premises, that it is almost needless for me to do more than refer you to that very clear and circumstantial document. It will be remembered that the average fall per mile on the Enfield Falls is 10 feet; while the greatest amount of fall in any mile on the Roanoke, between Clarksville and Rock Landing, is 11.1 feet, and in no other mile does it exceed 8 feet and a small fraction. And admit that the greatest possible success has been reached upon this subject, (of which, I have no idea,) and that 10 feet to the mile is the greatest amount of obstacle that can be overcome by steam—this point, Eaton's Falls, is below the intersection of the Gaston Rail Road with the Roanoke, and the improvement of the river, and the consequent use of steamboats to that point, would immediately result in important benefits to the valley of the Roanoke, and to a much wider extent of country which would then seek the river, as an outlet for their produce. But I would not stop here: I believe this improvement is yet in its infancy—otherwise it is the first the world has ever known, which reached its summit at the first stride. I believe the world is yet to be farther astonished and improved, by bolder efforts and more complete triumphs of art and mechanical skill. Whether the power of steam can overcome a current of 10 feet per mile, depends much upon the manner in which that fall is distributed. The report made by the engineer, to the Board of Public Works of Virginia preparatory to the improvement of the Roanoke is silent on this head; and for the purposes of steam navigation, it is a fact all-important to know. If a fall of 4 feet to the mile, is all in one pitch, its ascent is impracticable for steamboats constructed for shallow draught. Whereas a fall of 10 feet per mile, well distributed through the mile can be overcome with ease. Wherever then these hard strains occur, they must be distributed by art, or passed around by lock and canal.

For the purposes of towing freight boats, two or three steam tow-boats are in use on the Connecticut—that number being found sufficient for its trade. They ply from Hartford to any point up the river, to which freight is destined. They are of 20 horse power, and ascend the river at the rate of 2½ miles an hour, against a 1½ miles current, having in tow, 5 freight boats of 30 tons each. Around Enfield Falls there is a canal and locks, through which the steam tow-boats and freight boats pass. At Willimansett Falls, which is about 8 miles above Springfield, which is a short fall of about half a mile, the boats are carried up by the power of horses or oxen, by means of a windlass, with ease and despatch. The descent at this point is 9 feet to the mile. We were informed by Mr. Cuvier, superintendent and manager of the steam tow-boats, that one of the boats once passed that fall having 20 tons in tow. At Hadley Falls, the descent is 50 feet in 2¼ miles; but the fall is chiefly in one pitch, directly opposite the little manufacturing village of Hadley, affording fine power for driving machinery. Here again there is a canal with locks, through which all the freight must pass. From Hadley to Miller's Falls, a distance of 35 miles, there is but little fall; but the navigation is much annoyed by shifting bars and new accumulations of sand and gravel. Beyond this point, the navigation by steam has never been carried, owing, it is thought, more to a want of inducement, than any doubts about its success.

I have thus given you a succinct history of the various obstructions to the navigation of that river for a distance of seventy miles above Hartford, and the means by which each has been overcome. The cost of the improvement from Hartford to Miller's Falls is said to have been between 3 and $400,000. And if the public spirit of the little state of Connecticut, with an extent of territory not larger than the counties touching the Roanoke from Weldon to Danville, with agricultural resources not half equal to the same district, can accomplish so much, why should the people of the extended and fertile valley of the Roanoke and its tributaries, remain longer slothful and inactive? This is an inquiry which directs itself peculiarly and pointedly to the members of the Roanoke directory, to whom is committed the important trust of presiding over the improvement of that river. Recent movements in this part of the state, on the subject of internal improvement, should awaken your zeal, and quicken your efforts. What means the scheme of constructing a rail road from Evansham to Danville, and thence upon the ridge which nearly overlooks your river, to the same point of termination with yourselves? It means, clearly, that the river in its present condition, and with the present means of conveying produce to market, does not meet the public demands. What means the Rail Road Convention lately held at Charlotte Court-house, to take into consideration the policy and practicability of penetrating the Roanoke country with a rail road, from Petersburg or Richmond to Danville? It is another voice of discontent, to which you cannot turn a deaf ear, and which speaks to you in language which you cannot misunderstand; and which, if you have that share of public spirit which the place you fill would seem to indicate, you cannot misapply. It means that you must arouse yourselves to more extended views and bolder reaches for the public good, or the share of trade which now descends your river, will seek a vent, by some surer and more expeditious route. We, the citizens of Clarksville, have asked you for an object in which we have the concurrence of every reflecting man in the valley of the Roanoke. A member of your own body tells you, (and we presume from his opportunities, he speaks understandingly) that the thing is practicable. You have 40 efficient hands, accustomed to, and skillful in work of this sort; you will find a willing spirit, and a helping hand, in every stock and property holder upon the whole line of the Roanoke; and we have as strong a claim upon the surplus revenue, (which has lately fallen to the share of our state, and which doubtless will ultimately be distributed for purposes of this sort,) as any portion of Virginia. In the full view of means of this sort, why fear the effort? Think you, if steam boats were plying, successfully, from Danville to Weldon, and from the upper regions of the Staunton to the same point, we should ever have heard of a rail road from Danville to Weldon, or that a rail road convention would have ever assembled at Charlotte Court-house? Instead of this, there would have been rail roads from the Yadkin to Clarksville, from Evansham to Danville, and from numerous other points, all seeking, upon the waters of the Roanoke, a cheap and easy outlet to the ocean.

T. CARRINGTON.

From the Ohio Farmer.

RAISING CHICKINGS.

The subject upon which I am about to write, may excite a smile upon the faces of some, but if I succeed even in rendering a small service to any, the object will be accomplished. Possibly I may throw out a few hints that may be useful in increasing the number and quality of an animal that is so universally made to conduce to the luxury of the table, and the proper sustenance of the human system.

In the first place, then, I would advise those interested to procure for themselves a good breed of fowls. The pair I sent you last fall, I consider nearer to profection, in all respects, than those of any other breed. I call them the ostrich breed, from their strong resemblance, when about half grown, to that famous bird. They are large—their habits are very domestic—they lay well—set well—hatch well—and nurse well—and their flesh is very delicious. Have a well sheltered place for them to roost in, with a sufficient number of places for them to lay their eggs. Let your box be about a foot wide, and about fifteen inches high—with partitions about ten inches apart. The box to be enclosed on every side, with the exception of about six inches of the front, and at the upper part—place the box enough against the wall to prevent the depredations of children, &c. The hen is fond of a small aperture to creep into for the purpose of laying. At the proper setting season remove your eggs carefully every night into a safe place to prevent their freezing or getting much chilled, which will prevent their hatching. No "nest egg" is necessary upon this plan. The nest egg, in my opinion, seldom produces a chicken early in the spring, because of its generally having been chilled.

While the laying business is very brisk, prepare as many setting boxes as you may think fit. Let them be about eighteen inches square, enclosed on every side, with a loose cover for the top, not so tight as to shut out the air; put hay or straw enough in to form a nest, in which you may place about thirteen eggs—put the hen in the box and lay on the cover, with weight sufficient to prevent her from knocking it off. You may confine her without any injury, for three or four days, at the expiration of which time you may take off the cover, and leave her till she hatches—which, almost every body knows, will be in exactly twenty-one days from the commencement. The advantages of the large box are these: It gives room to move round without breaking the eggs, and the little ones a chance of coming out without the danger of their running away. When hens set on the ground or in unprotected places, they are subject to be interrupted by animals, and when two or three chicks are strong enough to run, they leave the nest, and the mother, following them, leaves the half-hatched to perish. This is a great loss of time, eggs, and chickens.

As the warm season advances, always endeavor to set three hens exactly at the same time—they will consequently hatch at the same time, and you can then divide the chickens of the three between two, and they can generally take care of more than they can well hatch, if properly managed.

Make as many moveable coops as you think necessary, with a shed roof and slats in front, which place in some safe place from hogs, in the sun—the sun is very invigorating to young chickens. The hen and chickens should be fed with corn meal, wet with water and milk, three times a day, and watered at least once. The hen should be kept confined in this way at least for a week, to prevent her from leading them into the wet grass in the morning, which is very prejudicial to their well being. At the expiration of that time, if the weather is good, you may place a block under one corner of the coop and let them out; at night they will return and take possession again, when you should take away the block, and keep them in again until the dew is off the grass. If the weather is unpleasant keep them in all day.

When the chickens acquire more size and strength they should be fed in what is called a "chicken feeder," which is a covered enclosure six or eight feet square, with slats just close enough together to admit the chickens, and exclude the older fowls.

Each of my hens last year raised to perfection, on an average, at least twenty chickens. They each raised two broods, and several hatched three times.

When the chickens are taken from one hen and given to another, the one from which they are taken should be confined for about a week and then set at liberty, when she will soon commence producing another family.

From the Journal of Commerce.

ANTHRACITE COAL.

We often hear of the progress of steam, the progress of improvement, the progress of the age, &c., but the progress of *coal* in this country is scarcely less remarkable; as will be seen from the annexed schedule, derived from a more particular statement in the Philadelphia Commercial List and Price Current. The first column of tons shows the whole quantity in the Philadelphia market from year to year—the quantity remaining on hand at the close of each year being included in the stock of the year next succeeding.

Year.	Tons in market.	Sold.	Remaining.
1820	364	364	none.
1821	1,073	1,073	none.
1822	2,440		little.
1823	5,823		do.
1824	9,541		do.
1825	35,536	35,536	none.
1826	47,545	42,546	5,000
1827	68,365	60,365	8,000
1828	90,302	72,302	12,000
1829	125,815	107,815	18,000
1830	192,934	192,934	40,000
1831	214,971	214,971	none.
1832	364,051	294,051	70,000
1833	560,000	425,000	135,000
1834	514,936	394,939	120,000
1835	680,750	677,435	none.

From the Silk Culturist.

ACCLIMATION OF THE CHINESE MULBERRY.

The Secretary of the Horticultural Society of Antwerp, M. Emilien de Wael, now on a tour of the United States for scientific purposes connected with entomology, &c., has communicated to the President of the Massachusetts Horticultural Society the method of acclimating the Chinese Mulberry, as practiced in Belgium, and which we think would be attended with like success in this country. We copy the whole letter as presented to the society, and published in the New England Farmer.

"Since I have been in this country I have heard of several complaints, chiefly from the Hartford mulberry tree planters, of the difficulty experienced the last two years in making the *Morus Multicaulis* stand your winters. This kind of mulberry is easily acclimated if a proper mode of culture be adopted in places where it is planted. In Belgium, the winters, notwithstanding they are not so severe as yours, often give us great trouble, and the influence of the cold was was repeatedly experienced on these mulberries, which were often killed down to the roots.

"The late *J. Le Condele* of Hambeck, near Brussels, suggested the idea of having different modes of experiments adopted in distant places. And the one which proved the most efficient, was to cut down yearly, the Morus Multicaulis, in the same manner as is done with willows in a *Salictum*, that is to say, at a few inches above the soil, and to cover the remaining trunk with dead leaves; in three or four years, the roots being stout enough, they did not require any more covering. From the buds preserved on the plants, fine and hardy shoots came forth, giving larger and more lively leaves to feed the silk worms upon.

"It has been stated to me in a letter from Batavia (Island of Java,) that this mode of culture is much in use near Manilla and in parts of China not on account of the cold, but in order to keep the Morus in a shrubby state, which affords greater facility for gathering the leaves in the season when desired. There the mulberry seems to be planted in fields as Indian corn is here—in the fall of the year the plants are deprived of their branches, the number of which is continually increasing, and growing in one season from five to eight feet, which growth is fully equalled by our own. I would advise a similar experiment in this state; it might, perhaps, answer well."

From the Quarterly Journal of Agriculture.

HORTICULTURE—COMMON CABBAGE, EARLY YORK CABBAGE, LONDON NEW YORK CABBAGE, SAVOY, BROCCOLI, AND EARLY WHITE WARWICK PEA.

By Mr. Towers, Author of the Domestic Gardener's Manual, &c. C. M. H. S.

The *Brassica*, or cabbage tribe, presents us with the most important crops of the season, I mean the period included between the first of June and the two succeeding months. It is proposed to select three of the numerous species, namely, 1st, Common round-headed or hearting *cabbage*—2d, The *Savoy*—3d, *Broccoli*.

1. *The Common Culinary Cabbage, Brassica, oleracea*, Sect. 4. of Decandolle, No. 4. *elliptica*, the Early York and particularly that fine improved variety, now called London New York Cabbage. All the members of the tribe belong to one family or genus, termed *Brassica:* they are found in the natural order *Cruciferæ*, the leading characters of which are four opposite petals, ranged in the order of a cross; there are four petals or calyx-leaves, six stamens, two of which are rather shorter than the other four, and this latter circumstance gave rise to the name selected by Linænus to designate the member of his 15th class *Tetradynamia*, a compound Greek word, which indicates the power of *supremacy* of *four* out of six fertilizing organs. It may be of some importance to the farmer and cottager to be informed that, among all the plants of this class or natural order, not one perhaps is pos-

sessed of any really deleterious property. Among nearly one thousand species, as Dr. Lindley observes, "scattered over the face of the world, all are harmless, and many highly useful."

The varieties of the cabbage are numerous, but he *who possesses* the best Early York, has that which combines most of the valuable qualities of that excellent vegetable—compactness of heart, firmness, sweet flavor, and convenient size and form; it is also hardy, of very ready culture, and occupies but little space. I do not recommend it merely as a *culinary* vegetable; it might, and I think should, be made to rotate with the crops of the farm. It is not my desire now to digress, but I hope on a future occasion to adduce facts which will go far to prove that every farm throughout the kingdom would be improved, and the agriculturist proportionably benefited, by a greatly enlarged rotation. The land has powers and capabilities to double its productive return: We southerns are much indebted to our northern brethren for the lessens of wisdom which their refined system of agriculture has already taught us, but these cultivators, skilful and preserving as they have effectually proved themselves to be, may still advance; and with this conviction before me, I hope I may not be deemed presuming, if, at the earliest opportunity, I venture to attempt to fulfil the intention which I have alluded to above, and for which I am collecting the requisite documents.

The *soil* for cabbage should be a sound mellow loam, of a quality usually termed *fat*, or unctuous, wherein the *silex*, which forms its chief constituent, is in a state of extremely minute division, and united to a greater proportion of argillaceous earth (*alumine,*) than most common, gritty soils are; but the chief desideratum of an unctuous loam is the impalpable state of the silex; for I have analyzed one of the finest loams I ever saw, without being able to detect in it more than five or six per cent. of clayey substances, and scarcely a grain of chalk. But the cabbage will do well in most soils, provided it be exposed to the full influence of light and air, and be not shaded or stifled by trees, shrubs, or buildings.

Seed.—This will retain its vegetative power for three or more years, but it is always better to employ that produced in the preceding season, or if two or three year old seed be used, it should be tried in heat, sown in a flower pot: a serious loss of time may be occasioned by a failure of the seed-bed. An ounce of seed will suffice to sow forty square feet, if scattered broadcast, but less will be required if it be sown in drills, six or seven inches asunder; and this method is always advantageous, because the Dutch or thrust-hoe can, at any time, be passed easily between the rows. If cabbage be cultivated in the field, it is calculated that half a pound of seed will afford more plants than will grow on an acre; and it is stated, in recommendation of the vegetable for the purposes of the farm, that if the cabbages be cut, freed from bad leaves, and carried to the cow-yard, "they are more beneficial than hay, given in any proportion, when only combined with straw."

In the *fattening* of neat cattle, an acre of good cabbages may be nearly sufficient for three beasts of from forty to fifty stones each, which have been grazed in the pasture during the summer. A middle-sized bullock, in general, consumes about 100 lbs. in twelve hours."[*] "Half an acre will be nearly sufficient for 100 sheep, when the crop is good: a sheep consumes nearly 10 or 12 lbs. in twelve hours." (*Baxter's Agric.*) I have repeatedly tried cabbage in cow feeding, and on every account recommend the substitution of *York cabbages* for the coarser and more bulky varieties.

In *garden-culture*, we have to consider the object of the cultivator; if spring or early summer cabbage only be required, one sowing of a single long row or a small bed will suffice. In the southern or middle counties of England, it is usual to limit the period of sowing between the 6th and the 12th days of August; but in the north, I presume that the third or fourth week of July should be chosen. Experience has proved that seed sown early in July, will produce plants which are liable to run to seed in the following spring; while, on the contrary, the plants of late sowings rarely acquire strength sufficient to resist the rigors of the winter. *The soil for a seed-bed* ought to be lighter than that used during the future growth of the plants: it should be moved to the depth of a few inches, and made very fine: then, the line being strained tight, the first drill is to be cut by drawing the angle of a hoe in the direction of the line, with its edge resting against it. An inch or less in depth is sufficient; but, as all seeds rise better if they rest upon a true surface, and be closely embraced by the mould, it will be proper to level and compress the bottom of the little drill by patting it with the back of a wooden, round-headed rake, or by placing a long pole, like the handle of a rake, into it, so as to form a sort of groove. In this the seeds are to be scattered as regularly as possible, after which it would be as well to dust them over regularly with a powder composed of two parts (say *pounds*) of powdered quick-lime, one part of coal-soot, and one sixteenth part (one ounce) of flour of sulphur. This mixture is inimical to insects, and does not injure the young plants. The groove is next to be filled up with fine earth, which is to be made firm and even, by pressing it down with the flat of the spade. In like manner, all the other drills may be made and finished. If the weather be showery, and the ground in a moist state, but still free and open to work, nothing more need be done. It sometimes happens, however—as was the case to a very injurious extent throughout the summer of 1835—that the soil is found dry even to dustiness. In that case, as it will not answer to let the critical period pass over, the intended bed should be watered copiously for three successive nights, till it become complely moist, and a mat or two must be thrown over it during the intervening days. Seeds sown in soil thus prepared, will vegetate very rapidly; for warmth and moisture are the prime actuating agents of vegetative life, as direct *solar* light is that of maturation. Waterings, or rather the ordinary sprinklings, so termed, will prove of no avail, if the seeds have been sown in arid soil, as was fatally proved last year. In hot sunshine, the mat ought to be used till the seeds vegetate. *The seedling plants* will be liable to the attacks of slugs and other enemies; to guard against which, they may be sprinkled with a little of the powder mentioned above; or the spaces of soil between the rows may be covered with dry saw-dust or chaff; but thick sowing is perhaps the most effectual means to secure a sufficient supply, and it is always prudent to practice it, because many seeds are inert; and it is better to displace the supernumeraries by timely thinning, than to have a paucity of plants, nine-tenths of which may perish by accidents. When the first true leaves appear, and acquire a little strength, much of the danger will be past, and the plants ought to be thinned out, so as to stand an inch asunder. Again, as they advance in growth, they ought to be reduced in number till double that space intervene between plant and plant.

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[*] There must surely be some error in this statement, of an acre of cabbage being able to fatten nearly three beasts of from 40 to 50 stones each: 100 lbs. of cabbage in twelve hours, that is the average number of hours of day-light in each day, for twenty weeks from the end of October, will amount only to 6 tons 5 cwt. Now a middled-sized ox will, in that time, consume 30 tons of Swedish turnips. Do 6 tons 5 cwt. of cabbage yield as much nutriment as 30 tons of Swedish turnip? Ed.

Transplanting.—Some gardeners have attempted to obviate this operation; but the roots first produced are few in number, though strong, and of considerable length: the plants also acquire a tall and shanky growth; and above all, it is evident that, if cabbage plants be made to perfect their growth on the site where the seeds were sown, the allotted space must be very great, because they must be thinned out so as finally to stand one foot asunder at the least. Transplanting, therefore, should be practised, and that, too, as soon as the young plants have become three or four inches high, and begin to crowd each other. The operation effects two or three good objects. It causes the roots to produce a number of short fibres, or, as it is termed, to become "stocky:" it dwarfs the plants, and, while making them strong and compact, secures them to the soil; and it enables the grower to protect those left in the seed-bed (as some always should be) by covering of mats thrown over arches, formed of hoops or pliable rods, in the event of very severe weather.

In transplanting, let the bed or plot be a good firm loam, if possible, pretty well manured, thoroughly digged, and in a free, open situation. Select strong plants of nearly equal growth, and insert them in rows by means of a dibble or trowel, fixing each firmly in the soil, eighteen inches apart *every way*, if the variety be a free grower; but the small Yorks will do very well if the rows be that distance apart, the plants standing only twelve inches asunder in the lines or ranks. It is indispensable that the soil be brought closely to the roots; and made to press them firmly in every part; and should the weather be dry, much time will be gained by making the holes so deep as to receive the plant to the full length of the stem of each, and filling every hole brimful of soft water: then, by pressing the soil laterally and on every side with the tool, the roots will become puddled in, and secured at once. The period for the work must depend upon the growth in the seed-bed; and if the season be early, and the weather warm and showery, the transplanted cabbages may grow so rapidly as to require the check of a second removal, or at least to be raised up and re-set; but in general, and under ordinary circumstances, it will be sufficient to leave them undisturbed, as then the crop will be ready for culture at a more early period of the spring. In the south, it is no uncommon circumstance to cut fine-hearted cabbages in April, and very good ones in May. In the north, the growth must be more tardy in most situations.

The *seed-bed* will require care and attention. I have said that some plants ought to be left in it; and I urge the practice, because, in severe winters, the entire crop is sometimes cut off. The seedlings remaining, ought however, to be raised up; the longest roots cut back nearly one-third, and the plants be re-set in regular order and distances. Thus, supposing that 200 plants remain in it, and be made to stand four inches apart in rows which are six inches asunder, a bed little more than twelve feet long and about three feet wide, including its edges, will contain this valuable stock, which in severe weather could be covered by three or four garden mats, and thus secure a pretty ample supply of plants for the spring. Another precaution may always be resorted to. In transplanting, deep drills or grooves can be formed by the hoe or spade, and along these the plants may be set so deep, that the lowest leaves may stand just above the soil. I adopted a still more efficient plan of security last October, though I do not recommend it because I think the growth in the early spring months is thereby retarded. Having a piece of ground set up in ridges, nine inches high, and the time pressing, I planted my young cabbages in the bottom of the trenches between the ridges. On three occasions the thermometer fell twenty-two degrees below the freezing point, and not a plant has been touched, though no covering was applied at any period of the winter. My broccoli, also, has stood in perfect security, in consequence of the stems being lower than the level of the edges of trenches made expressly for them. However, as cabbages ought to be hoed freely in the autumn, and the spaces between the rows digged once or twice, as soon as the plants resume growth in the early spring, it is evident that the ridges present an obstacle to these important operations. If the winter prove mild, the cabbages will progress in some degree; but if by cold they be rendered torpid, they will start into growth with the early return of solar influence: a few may fly up to seed, but the greater part will form hearts, and can be cut in succession. In cutting, it will be prudent never to take off the green and healthy leaves, those that are inert and yellow, will scale off of themselves, or with the slightest effort: but the green and firm ones have still an important office to perfom, in perfecting the auxiliary buds which produce young sprouts. These secondary cabbages, or "greens," affect an open growth, and in themselves furnish a delicious vegetable; but they may—that is a portion of the best formed among them—be devoted to another purpose of considerable utility in garden economy. The shoots when about five or six inches long, are to be gently twisted off from the stem, and the lacerated heel of each being trimmed perfectly even and smooth with a very sharp knife, but not shortened; the young plant thus rendered a cutting is to be very carefully planted in lightish, sandy, fresh moved loam, so deeply as nearly, but not quite, to include the entire stem. The setting-stick or dibble is to be thrust diagonally into the ground in three or four places, in the direction of the heel, so as to fix it firmly in the soil, and then a little water should be given to each plant to wash the earth closely about the stem. Detached shoots so treated, will frequently produce roots speedily, and bring a supply of excellent secondary cabbages, true to the original varieties: *seeds* are apt to sprout, owing to cross impregnations.

To sum up the chief points of cabbage-culture for spring and summer main crops, it must be observed that the *period of sowing* should be strictly attended to: the *seed-beds* are to be slightly hoed to keep the ranks clear of weeds; the stronger plants are to be timely removed to the final beds, wherein two autumnal hoeings and a moderate earthing up must be given during the progress of growth. On the approach of spring, the intermediate spaces are to be digged or forked, after the removal of the inert leaves, and the operation should be repeated when the plants evince the tendency to fold up their inner leaves for hearting. By a careful attention to these needful processes, a bed of fine cabbages will, in favorable seasons, be secured. Having thus dwelt so minutely upon the routine culture of the cabbage for the main spring and summer supply, I shall only allude to that part of the treatment of succession crops, which refers to the summer and autumnal months.

It is usual to give directions for sowing the seed at several distant periods; but my object is to obviate trouble, and to simplify operations as much as possible; and as I have proved that, by attentive management, a regular supply of fine palnts may be obtained from one extra sowing, I shall presume that an extensive seed-bed or plot exists, having been prepared late in March or early in April. The mode of culture will be understood by the directions already given: what, therefore, remains to be said, will apply to the order of routine which ought to be observed subsequent to the *first of June*. At that time, we may suppose that the greater part of the cabbages have been cut, the stems remaining being left for the production of sprouts. The seedlings of the April bed that are in a state to be transplanted, should be carefully selected, and set in a bed of rich soil, watered, and attended to in every respect as were those of the spring crop. This first bed, with the cuttings of the sprouts and the other shoots yielded by the old stems, will produce an ample supply of a second crop during July and August.

After the removal of the seedling plants, those which remain in the seed-bed should be greatly lifted and replaced, but at regular distances three or four inches apart; the ground should be moved, cleared of weeds, made level, and well watered if the soil be in a dry state. Should the plants be very numerous, a hundred or two of the best might with great advantage, be moved to a succession bed to stand in rows, six inches apart, plant from plant. Thus they will acquire stocky roots, and be checked for a time; while the seedlings will gain strength from the additional space afforded them. If a bed be formed and planted for cabbaging in June, and thence every two months; and especially if—as I must presume—a previous transplantation had already been made during May, it is obvious that a succession of crops will be secured during every favorable season till the end of October; and I may add, from positive experience, that if the weather be then fine, and the succeeding winter prove open and mild ("a green yule,") any remaining stock in the seed-bed, however long-shanked and ungainly they may be, i set deep in the soil of a well prepared bed, may make good progress to the end of November, survive the winter, and produce excellently hearted and sweet-tasted cabbages in April. Small they will be, and some perhaps will fly to seed; but those which do succeed, will amply reward the attentive care of the grower. My experience applies, of course, to the latitude of London, though in a county far westward, and much later in its productions; but I presume that in the north also these hints may be rendered to a certain extent available.

2. *The Savoy, Brssica Oleracea Bullata* of De Candolle—a variety distinguished from all other hearting cabbages by the puckerings of its leaves. It is one of the prime winter vegetables, and well merits the attention of every one who has a garden or kail-yard. There are three subvarieties—the large yellow, the green, and the smaller *green*, which is the hardiest of the three.

The savoy must be sown pretty early in the spring, and therefore I say nothing now of the early processes of its culture; but as it will require transplanting to plots where it is finally to remain, it will be needful to observe, that, as in all respects the intermediate culture will, as nearly as possible resemble that of spring sown cabbage, the directions above given will apply to it. In England it is customary to transplant at two or three periods of July for the winter supply; but it will be proper to commence the work earlier in the north, and to finish by the middle of that month. The ground should be well digged and pulverized; the texture rather light, and the quality rich. Draw drills or shallow trenches about thirty inches apart; tread along the drills or press them with a broad pole, till the soil become smooth and compact; then plant the savoys eighteen inches asunder, filling the holes with water, and fixing the roots firmly in the soil. After they have become established, and begin to grow, the spaces will require the hoeings and diggings which are so essential to the progress of plants of all the cabbage family, and have been before alluded to. As winter approaches, the earth aught to be brought up to and about the stems.

The planting in open, manured trenches, in dry weather will not only secure the growth of the plants, but greatly tend to protect them from frosts during winter. *Savoys* are not considered to be in perfection, till they have been exposed to a degree of frost; and they will subsequently furnish the table throughout the winter months.

3. *Broccoli.*—This variety of the cabbage tribe is divided into a number of subvarieties, all of which are excellent furniture for the garden. By Professor De Candolle it is placed in the sixth division of his arrangement, *Botrytis (Brassica botrytis) i. e.* resembling a bunch or cluster of grapes, but this grape-like species of variety admits of another sub-variety, as No. 1 is the cauliflower, *Cauliflora*, or flowering cabbage; But No. 2 is the broccoli, and is designated as *Asparagoides*, or asparagus-like cabbage. Though the similitude of broccoli to asparagus may appear somewhat fanciful; yet as precision of classification is obtained, it will be perceived that it is far better to enter into minutiæ closely, than to presist in a mode of arrangement which is equally ill-defined and undiscriminating.

This delicious vegetable is perhaps without its rival in the garden, and its culture is very simple; it is too late, however, in the season to raise it from seed, and therefore I defer to enter upon a regular detail till the spring of next year. I have, however, raised some of the finest *Portsmouth* cream-colored, from seeds sown after the 10th of June, which produced compact and exceedingly large heads in the following April or May: it may therefore be worth while to try a small sowing as early as possible in June, following the directions, in as far as concerns, the mode of preparing the soil, &c., which are given under the article cabbage, and transplanting into manured trenches, six inches deep, and ten or twelve inches wide, not later, if possible, than the third week of August. In the event of frosts, before November, no time should be lost to bring the earth that was thrown out and lay as a ridge on each side of those trenches, to the stems of the plants, as is done in earthing celery.

But if we may trust some modern writers of new discoveries, *broccoli may* be propagated by slips, with the most successful results. Every one ought to try the method who has in his garden the stems of plants, the heads of which having been cut show a tendency to protrude sprouts. In *the middle of June*, says a writer, whose article is now before me, (or for Scotland, says *as early as possible in June.*) "I slipped off a quantity of the side shoots, and planted them. I had them well watered, and well secured in the soil. They struck root in a very short time, and made strong plants which produced heads of a fine size at the usual season." "I am persuaded the plan is well deserving attention, not only with broccoli of the same kind I have cultivated *(late flowering purple)* but with many other kinds; thus an excellent variety might be perpetuated without the risk consequent upon seed."

I have not myself had an opportunity of experimenting upon this vegetable, since I saw the article quoted from, but have reason to believe the plan has been proved to be feasible; in fact, there is nothing in the analogy of the species with its type, which is unfavorable to the operation.

4. *Peas.*—At this season of the year it may appear almost too late to speak of the cultivation of the pea; but I am inclined to notice it for a reason which will be shortly explained.

The *garden-pea*, of which there are many varieties, is found in the fourth tribe, *Viciea* (that is among the vetches) of the great suborder *Papilioncea* of the natural order *Leguminosa*, and in the 17th Class, 4th Order of the Linnean System, *Diadelphia, Decandria.* Every one is aware of the peculiar shape assumed by the blossoms of plants of the pea tribe; which, it is evident, can readily be made to constitute the type of a very natural class, in which most of our esteemed leguminous or pulse-bearing vegetables are to be found.

At some future day, I intend to enter at large upon the characters of all the favorite peas for table use; but on the present occasion I only alluded to one, which is a great acquisition, and of very recent introduction, the early white *Warwick.* It is adapted to field, as well as garden culture, is moderately prolific, hardy, extremely early, rapid in its course of growth, soon off the ground; and of a high peculiar flavor, that to some persons is extremely agreeable, though others do not affect it.

The seed, two years since, was dear, its price is now reduced; and it is stated that three crops may be produced on the same land, and leave it open for wheat. This, however, I have not seen proved: but having grown the pea, I can recommend it to every one who wishes a rapid grower. A crop sown in a long drill very early in June, may be succeeded by another sown in July, with every pospects of success. If the ground be dry, from a continuance of hot weather, the best method to ensure a vigorous plant is to dig a moderately broad trench, to saturate the soil at the bottom with water, to return the earth into the trench, and make that very wet; then, after covering the earth with mats, or green boughs for a day, just to permit the earth to settle, and so far to drain itself as to become in a workable condition, to strike a drill three inches deep, to sow the seed along it pretty thickly, but not in the crowded state too frequently seen; water should then be poured from the spout of a pot over peas, and the loose earth returned upon the seeds, and pressed or troden firmly over them. One liberal preparatory watering thus given, is of more avail than fifty subsequent sprinklings. *Mildew* so common on the plant of autumnal crops, is, as Mr. Knight truly observes, obviated. He has had perfectly fine peas on his table in October, and it is certain that where disease can be prevented, peas in that season are a delicacy of the first rate excellence. The Warwick, I think, promises to prove a valuable species for the purpose of a late crop, because the course of its entire culture is more rapid than that of the "frame" or early Charlton pea. When the plants rise above the soil one inch, the earth near the roots aught to be loosened by the thrust hoe. Another hoeing must be given when the plants are three inches high; and then, after drawing the lightened earth to the stems, to the height of an inch and a half. as a ridge on each side, branching sticks a yard high are to be applied. Nothing favors pea culture more than judicious sticking; the plants are brought to the light, are supported, and at the same time protected. *Mildew* is the bane of autumnal crops: it seems to be promoted by a droughty state of soil, high solar heat during the day, and cold dews at night: rapidity of growth produced by a deep moist bed, procured by preparatory and *profuse* waterings, appears to be the only effectual security from this fungus.

From the New York Farmer.

RELATIVE VALUE OF MERINO AND SAXON SHEEP.

Cortland Village, Aug. 28, 1836.

My Dear Sir:—A "raw and gusty day"—cold enough to make a greatcoat a luxury in dog-days —drives me within doors, and for the first time since it was made, I find myself at leisure to fulfill my long neglected, but never forgotten promise.

Perhaps I can present nothing at this time, of greater interest to the readers of the Farmer generally, than the addition of a little more testimony in relation to some of those points, so warmly mooted at this day, connected with sheep breeding—the several circumstances which determine the comparative profitableness of the rival breeds. Of the coarser wool and heavier carcassed English varieties, I know nothing, and therefore shall say nothing. My acquaintance has been exclusively with the Merinos and Saxons, and whatever weight my opinions may be entitled to, on other accounts, the fact that I have among my flocks about an equal number of the two breeds, or rather, the two varieties of the *same* breed, gives me the liberty of laying claim to at least, *as much* candor. as the mass of the disputants who have entered the lists in favor of one or the other of their respective favorites.

The actual difference between the Spanish and German families, of this celebrated race of sheep, I am convinced has been greatly exaggerated. When it is borne in mind that only about seventy years have elapsed, since Merinos were imported into Saxony, from the mother country, and that from these, and subsequent importations of the same stock, the whole Saxon family have descended, it must require a great stretch of credulity to believe that disparities so great and radical, so unaccounted for by any change of circumstances, could be brought to exist during this period, in the *same* breed, maintained *pure*. The only important causes which have operated to create a difference, if we except the circumstance of the Saxons being descended from picked sheep—(the original importation being a gift, to which even national importance was attached, from one monarch to another,) are change of climate, and the neglect which the parent stock suffered in the long and bloody wars of which Spain has been the theatre. It is a well established fact, that sheep changed from a moderately cold, to a warm climate, suffer a visible depreciation in the fineness of their wool, and the converse of the proposition is equally well established. This is doubtless one material reason of the superior fineness of the German Merino, and if we may trust Chancellor Livingston and Col. Humphreys,* the like effect has been perceivable in the several countries of *northern* Europe, (with the exception of England, where extraneous causes, necessary here to be examined, have operated,) into which the Merino has been introduced. In addition to the loss suffered by the flocks of Spain, in the peninsular war, by some of the choicest ones being driven into France by the French generals, and by tens of thousands being indiscriminately slaughtered for the subsistence of the conflicting soldiery and starving peasantry, it must be evident, that in such a struggle, this as well as every other branch of agriculture, would be utterly neglected. Such was the case to a most unfortunate extent, and the Spanish flocks have never recovered from the shock. On the other hand the Merinos of Saxony, with the utmost care bestowed on their breeding and general management, at the Electoral sheep farms of Lohm, Rennersdorf, Hohenstein, and more especially at the celebrated establishment at Stolphen, (near Dresden) could not, of course, fail of *improving*, unless the Germans have been deplorably deficient in even the "outside" principles of sheep husbandry.

The popular exaggeration of the difference between the Spanish and Saxon varieties, springs, I have no doubt in a great measure from unacquaintance with *pure blooded* and *well bred* animals of one or both kinds. The man whose ideas of pure blooded Saxon sheep, for example, have been formed on those "long-legged, thin-quartered, flat-sided, narrow-boned, not sufficiently deep-chested, and long-necked" animals, which we daily hear called "pure Saxon," if a decent half bred Merino, or indeed a *decent* sheep of any breed comes under his inspection, and must of course prefer it. I will not say that none such are pure blooded, but I will say, that it is the result of defective breeding, and not characteristic of the race—and I will further say, that in nine cases out of ten, such animals have been produced by a cross between Saxon tups, (deficient themselves, because selected, as is commonly the mistake, exclusively in reference to the fineness of the wool) and native ewes, or at best, half blood Merinos. The produce of the fourth cross are paraded forth to the world, and *sold* as "*pure bloods!*" There are those who know, with myself, that the "pure Saxons" of a certain county in this state, which shall now be nameless, were thus bred—that is, one cross of Saxon with half blooded Merino ewes, of Mr. Livingston's importation. Thus one-fourth of native blood mingled in their pedigree, yet alas! their sins are all laid at the door of the "pure Saxons."

There is another class of "pure Saxons," equally notorious, and equally often quoted When the "fever" for importing this race, first broke out, and the sheep sold for such extrordinary prices, how many vessels freighted to Europe, received orders to take in cargoes, or partial cargoes of the wonderful sheep, on their homeward bound passage! Let us suppose Capt. Tarpauling acting on these instructions. He sails for the nearest port within the prescribed limits; presents his orders at the commercial house with which he has done business; and Messrs. Van Beest & Van Bruggins immediately institute the proper inquiries. Every sheep breeder within fifty leagues, it is found, has the "*pure bloods*," just as they have in this country, to the inquiry of every one desiring to purchase! The most ludicrous scene of the whole, and the next in order in the farce, presents us Capt. Tarpauling, and perchance Mynheer Van Bruggins, (who acquired their knowledge of the qualities of sheep, on the deck of a vessel, and behind the desk of a Dutch counting-house!) superintending the selection of these sires and dams of untold generations of bona fide "pure bloods." In due course of time, they are landed at New York or Boston, and sold. That they are pure blooded Saxon, "*every body knows, because they were imported direct from Saxony!*" Before me lies a letter from a celebrated German sheep breeder and wool grower, who says:—

* * "From the Royal, and other celebrated pure flocks, (in Saxony,) bucks sell from $75, to $150 per head; and ewes from $50, to $100—and at these prices, they do not give any one his choice."

Add to this the expense of importation, and let every one judge for himself, how many of the *best quality* of Saxon sheep have been brought into our country, to be hawked round at $15 or $25 a head! The remark may seem somewhat presumptuous, but I believe it nevertheless true, that as many as three-quarters of the sheep in the U. States, called, and actually believed to be *pure*, are merely the descendants of imported German grade-sheep. The native German sheep on which the cross was made, did not differ greatly from the American native. I cannot but smile on raising my eyes to a German landscape, by Berchem, which hangs before me, to notice the close resemblance between his long-legged, lank-sided, thin wooled quadrupeds, and our native sheep. The value of the produce of such a cross, might be anticipated!

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* See preface to Chancellor Livingston's celebrated "Essay on Sheep," and Col. Humphrey's "Letter to the Agricultural Society of Massachusetts."

There is a variety of the Merino, dark colored, and coated with 'gum'—looking much as if he had been immersed in pitchmark, and the weight of whose wool diminishes about half in cleansing, which differs widely from the Saxon; and it is from an acquaintance with this variety, probably, that many have ever estimated the difference between the two families. But between the *most approved* sheep of Spain, and the *most approved* sheep of Saxony, no greater difference exists, than has been rendered, as I have shown, indispensably by circumstances, and there is no doubt in my mind, that *these* may be almost immediately *re-assimilated*, by inverting the order of events which have wrought the change, or in other words, subjecting the Spanish Merino to the same treatment the Saxon has received, and vice versa. Further —take 100 Saxons, "as they run," out of any large flock, and take 100 Merinos, also indiscriminately, from a large flock: from the Saxons, select select 25 of the heaviest and coarsest wooled, and from the Merinos 25 of the finest and softest wooled: put with each, a buck of their own stamp, and annually exclude those, from the original number, and their produce, which evince with the least distinctness, the characteristics of their flock: how long would it be before the Saxons would be metamorphosed into a flock of "old fashioned Merinos," and the Merinos into a flock of delicate and fine wooled Saxons? But, suppose instead of thus breeding with exclusive reference to a single point, ('fineness' or 'weight of fleece,) we, as traders say, "split the difference." If we find some of our Saxons getting too delicate and thin wooled, suppose we cross them with a *good* Merino buck and on the other hand, if some of our Merino fall below the proper fineness, suppose we cross them with *a good* Saxon buck. I have a buck, which I call Rambouillet, the produce of a Merino ewe and Saxon buck, (both however the best of their kind,) whose fleece this year, weighed 6lbs. washed, and sold in with my Saxon, at 80 cents, averaging *fairly* with the lot—making the snug little sum of $4 80, for a single fleece! Amongst my Merino ewes, I have a number whose fleeces I was at the pains to weigh, and which ranged from 4 to 5 lbs. I crossed these with pure Saxon bucks, which, although young, exceeded the average of 4 lbs. to the fleece, and I may be permitted to say, *as* fine as *most* of their blood, as in addition to having been *selected* at round prices, from the most celebrated flocks, their wool has been adjudged to staple with some of the best samples from Germany. I am exceedingly pleased with the produce. The lambs are generally wooled to their nostrils and pasterns, and are evidently finer than their dams.

The adventitious difference which has been created between the families of the Merino race, is not without its use. They both have their appropriate sphere. To the wool growers, the *perfection* of the Saxon variety, on the whole, combines the most advantages: to the farmer, who keeps but 50 or 100 sheep—who has not the conveniences for taking much care of them—who wants a quantity of medium wool for domestic consumption, and a quick sale of the remainder—the Spanish variety is the most profitable. That the "*perfection of the Saxon*" is the most profitable, "*when properly taken care of*," I may add to my own, the testimony of that enlightened gentleman, who had so often appeared as the champion of the Spanish Merino, in the agricultural papers of this state, for the last two years. The point he distinctly conceded to me, but claimed with a justice which cannot be gainsayed, that "there were very few such in the United States—not one where it is pretended there are a hundred." How can it be otherwise, when new flocks are generally started on the *cullings* of the old ones? The way to begin, (*me judice*) is exactly at the opposite extreme—with the *choicest* animals which can be purchased. One had better give $15 or $20 a head for a few, and *grow into* a flock, than give from $3 to $5 for cullings—the scum and refuse of a large flock. Such was the course which I adopted, and I believe I am reaping the benefits of it. My grown ewes averaged this year 3 lbs. per head, and the wool sold readily at 80 cents. As for *shape*, all I have to say is, that if any one who asserts, and there are those who do, that the Saxons are always deficient in this particular, will do me the honor to call on me, I will show him my sheep, and let him be his own judge. My Merinoes I thought did well, but they fell behind the Saxons about 30 cents to the fleece.

One word as to their relative ruggedness, and capacity of enduring the vicissitudes of weather, I have done. I lay it down as an axiom, that any sheep properly shaped and coated, will endure as much as it would be either humane or profitable to expose them to, were their power of endurance doubled. The quality of the wool is deteriorated, and a much greater amount of food consumed and wasted by flocks unsheltered in the winter. A sheep that is deep in the chest—broad on the breast, chine and loin—round and deep quartered, and covered with a thick fleece of wool, *with food and shelter*, will stand the winter well enough, be it Saxon, Merino, or what not. Last winter was the severest on record; yet hundreds, who called on me, will bear me testimony that my Saxons, during the intensest cold, stood up to their racks "uncurled"—fed well—and remained *fat*. I think the Merino would *endure the most abuse*, but I am well convinced that *either* will bear all they ever *ought* to be subjected to. Perhaps I may resume the subject on some future occasion.

I have the honor to be, with great respect, your obedient servant,

HENRY S. RANDALL.

ECONOMY IN LINEN WASHING.

After many experiments made by myself and others, I find that pipe-clay, dissolved among the water employed in washing, gives the dirtiest linen the appearance of having been bleached, and cleanses them thoroughly with about half the labor, and fully a saving of one fourth the soap. The method adopted, was to dissolve a little of the pipe-clay among the warm water in a washing tub, or to rub a little of it together with the soap on the articles to be washed. The process was repeated as often as required, until the article washed was made thoroughly clean. All who tried the experiment, have agreed that the saving of soap and labor is great; and that the clothes are improved in color equally as if they were bleached. The peculiar advantage of employing this article with the soap is, that it gives the hardest water almost the softness of rain water.—

[*Dundee paper.*

Extracts from the Journal of the Franklin Institute.

LIST OF PATENTS ISSUED IN FEBRUARY, 1836, FOR IMPROVEMENTS OF MACHINES, &c. TO BE USED IN AGRICULTURE, OR DOMESTIC ECONOMY.

With remarks, by the Editor of the Journal of the Franklin Institute.

For a *Machine for peeling Apples and Peeches;* J. W. Hatcher, Bedford county, Virginia, February 3.

This, we believe, is the sixth peeling machine that has been patented, and we do not think it any improvement upon the first, which was that of Moses Coates, obtained in 1803. The one before us, has a spindle, with a fork to receive the apple, a second spindle with an endless screw, a cog wheel, pinion, whirl and band, and other appendages for moving the knife, the apparatus for moving the knife is the only part claimed.

For a *Cooking Stove;* J. R. Cochran, Francestown, Hillsborough county, New Hampshire, February 3.

There is nothing in this stove worthy of special notice, its virtues depending upon the particular arrangement of the passages for heated air, and the dampers or valves. The claims are to "the form and coastruction of the apertures for the passage of the fire, and the dampers for closing either of them, or the passage under the oven, and the division of the passages for fire, by partitions, whereby the whole volume of fire is thrown on one side of the stove, and a greater heat thus produced on that side, and various degrees are produced in different parts of the stove at the same time, suitable for the different processes of cooking, and with less fuel than in any other stove of equal dimensious." As one object professed to be attained in a new cooking stove is, in nearly every case, to save fuel, we shall, by the time we have another five hundred stoves patented, not only save the whole, but have some to spare, should each of them save a little upwards of one five hundredth part only.

For a *Cooking Stove;* Daniel Williams, Scaghticoke, Rensselear county, New York, February 3.

This stove resembles, in form, a number of other cast-iron cooking stoves, having a body nearly rectangular, a fire place furnished with folding doors, an oven similarly furnished above it, and openings towards the back of the top plate, for cooking utensils. Its claim to novelty consists in making the fire place a sliding drawer, which can be brought forward upon the bottom plate; this drawer has a grate upon which the fuel is sustained, and a top plate, perforated for cooking utensils. When pushed in, there is, necessarily, a double plate between the fire and the interior of the oven.

The claims are to the movable, sliding fire place, the manner of connecting it with the other parts of the stove, and particularly to the obtaining by its means, a double bottom to the oven, and thereby regulating the intensity of the heat; the provisions for carrying off the steam, &c.

For an improvement in the *Cultivator;* James M. Garnett, Loretto, Essex county, Virginia, February 3.

This is called an improvement on the X, or Echelon Cultivator. "It consists of a curved cast-iron, marked No. 3, having in the under side two dovetail grooves, which the wrought iron marked No. 4, [shown in the drawing] is made to fit, so that when one point is worne out the other may be turned. Four of these are fixed in a bar of wood diagonally, at an angle of 45°, to a straight beam of the length and size of a common plough beam for a single horse."

For a *Machine for Shelling Corn;* Isaac A. Hedges, Elmira, Tioga county, New York, February 3.

This machine in its general principles, resembles the first shelling machine which was patented. It has a revolving cylinder and a concave, between which the ears of corn are to be shelled. The cylinder is to be formed of cast-iron staves, with spaces between them for the escape of the grains of corn; the concave is borne up by springs. The ears are to be put into a hopper above the cylinder, and to be conducted through a proper aperture to the shelling part. The claim is to "the concave cylindrical surface by a combination of staves, with springs attached as herein described; and the application of such surface so formed to the purposes of corn shelling; as also the application of such surface to a cylinder for the same purpose."

For an *Oven to be used over the common Fire Place;* Samuel Pollard, Orono, Penobscot county, Maine, February 3.

This patent is taken for an improvement upon the oven patented by the same person in June, 1835, and noticed at page 46, vol. XVII. The sheet-iron oven is placed, as before, across the chimney, above its throat, and in addition to the flue leading to it, about level with the surface of the fire, there is a second flue near the throat of the chimney, which is closed by a door. A grate is fixed in the flue to sustain fuel, that a fire may be lighted there when there is none in the fire place. The claim is to "the introduction of the second described flue, damper and grate; the outside cylinder and the damper above, or on the top of it, these being the additions now made, as improvements." The second cylinder forms the flue around the oven, and is like that in common use in similar ovens set in jambs.

For an improvement in *Saw Mills;* George W. Black, Montgomery county, Tennessee, February 3.

The object in constructing this mill is to apply the power above the surface of the ground. The main cog wheel, driven by any suitable power, gears into a pinion on a pitman shaft above the sills, the pitman extending thence to a rocking shaft which gives motion to a saw frame, hung in the usual way. The claim is to the horizontal pitman and its apurtenances, including "the entire mode of driving the saw, or saws, and the mode of applying the power to them," in which the patentee perceives numerous advantages, which we apprehend will not be realized in many situations, and no where, assuredly, where water power is employed.

For a *Straw Cutter;* Isaac S. Wright, Elbridge, Onondaga county, New York, February 3. (See specification.)

For a *Machine for Harvesting, Thrashing, and Cleaning Grain;* Eliakim Briggs and George W. Carpenter, Covington, Franklin county, New York, February 5.

This machine is to run on four wheels, like wagon wheels, the adhesion of the hind wheels to the ground carrying revolving scythes, a cylinder thrashing machine, and other apurtenances. The apparatus is not fully described, and we are very apprehensive that it had not been fairly tried before being patented, as we are of opinion that its promise upon paper would not be realized in the wheat field. Its power, to cut, convey, thrash, and clean grain, and the satisfactory concurrent action of all its parts, would not, we think, have given it a passport to the Patent Office.

The claim is to "the manner and principles of applying the power of a team to cutting, thrashing, and cleaning grain, by moving forward the machine; of cutting grain, of carrying it to the thrasher, of thrashing, and of cleaning grain, by power so applied." This claim does not, with sufficient distinctness, state the particular machinery for effecting the object, refers to no individual part of it, but appears to relate more to the end than to the means, whilst the latter is the only thing patentable.

For a *Horse Rake for Hay and Grain;* Joseph W. Webb, Mount Morris, Livingston county, New York, February 5.

Behind an axeltree with two wheels, there is a frame which sustains the rake-frame, and the latter slides up and down between cheeks, furnished with grooves for that purpose; upon the bottom edge of the rake-frame are teeth, curved forward and reaching to the ground; a man stationed on a platform above the axel tree, raises the rake-frame by means of a lever, when it has collected the desired quantity, and thus deposites it. The points of the rake teeth curve back suddenly to prevent their catching in the ground. The claim is to "the manner of raising or depressing the rake at pleasure, by means of the perpendicular grooves and the lever; and the manner of curving the teeth backwards, for the purpose set forth."

For a *Machine for cleaning smut from Buckwheat and Rice;* Samuel Richardson, Elmira, Tioga county, New York, February 5.

It is very well that the patentee sets forth no exclusive claim to this machine, as, were he to do so, he would encounter a host of competitors. The whole consists of a hollow cast-iron cone, in which runs a conical nut, both properly grooved, in the well known old coffee mill fashion.

For a *Press for Cotton, Tobacco, &c.;* Azel M. McLean, Russelville, Logan county, Kentucky, February 5.

This press consists of a lever working on a fulcrum between two upright posts, the articles to be pressed being placed under the lever, and resting on sills, or a platform on the ground. A rack and pinion below the long end of the lever serves to raise or lower it; and the improvement claimed consists in extending the lever beyond the uprights, so that it shall have a short arm projecting out far enough to press the articles by the elevation of the long arm, as they are pressed on the opposite side by its depression.

For a *Horse Power;* Dudley Marvin, Canandaigua, Ontario county, New York, February 5.

This machine is, in its general construction, like many which have preceded it, consisting of an endless chain floor upon which the animal walks, which floor is sustained by friction rollers running upon ways, and connected so as to form endless chains; it is the peculiar manner in which these are put together, upon which the patentee must depend to sustain a claim, and he says, "I confine my claim to the particular manner in which I construct the power chain, and the friction chain, as described, together with their combination with those accessory parts which are necessary to their action. I do not claim either of the individual parts as separate and uncombined."

For a *Churn;* Hezekiah Roberts, Seneca Falls, Seneca county, New York, February 5.

A vertical churn is to have the dasher made to revolve alternately in reversed directions, by means of a double strap, the two ends of which are wound round the shaft, and are alternately acted upon. To produce this motion, the patentee employs a wheel and pinion, on the shaft of the latter of which there is a crank and fly wheel. A pitman from the crank is made to vibrate a wheel which communicates the alternating revolution by means of the straps. The claim is to "the crank, connecting rod, spur wheel, pinion, and balance wheel." All of which are well known affairs.

For an improvement in the *Process of preparing bark and obtaining the extract therefrom;* Daniel Williams, Boston, Massachusetts, February 5.

We are informed that the bark is to be first divested of its outer part, after which the inner bark is to be cut into small pieces, and the tanning principle extracted therefrom by boiling, or by steam; the water is then evaporated and the extract fit for use. The thing claimed is the extracting tannin from the inner bark cut into pieces, instead of grinding or pulverizing it, by which means, it is said, the extract is more pure, being free from the admixture of the minute particles which remain in it when procured from the ground material.

How many thousand times the chemist has thus obtained the extract of bark in his laboratory, we cannot tell, but certainly more frequently than from the pulverized material.

For an improvement in the *Cotton Saw Gin;* William and James M'Creight, Winnsborough, Fairfield district, South Carolina, February 5.

The gin retains its usual form, but the patentees claim, "first, a movable breast; second, sliding ribs, and third, the centres of the brush, and the pivots on which they turn," which improvements, they say, render the apparatus more durable, and more easily kept in order.

"The breast is hung to the front of the gin with two hinges, and can always be raised so as to get at the saws," when they require any attention. The sliding ribs are so called, because they are made so as to shift, or slide, and expose new portions of them to the action of the seed, so that they may be shifted endwise four or five times, before they require to be renewed; they are confined at their ends by screwed cleats, which are loosened when the ribs are to be shifted. The pivots of the brush are made of square cast-steel, pointed at each end, and fixed in a manner which allows of their being shifted readily when one end is worn.

For a *Bee Hive;* James W. Hubbard, Canterbury, Merrimac county, New Hampshire, February 5.

There is not any thing in the contrivance of this hive which appears to merit particular notice, the thing claimed is a mere trifling matter of arrangement.

For a *Thrashing Machine;* Lewis H. Maus, Danville, Columbia county, Pennsylvania, February 5.

This is said to be an improvement on James Parson's thrashing machine. The cylinder and concave are to be of cast-iron, and the improvement appears to consist in the casting it in parts more light and convenient than the original machine; there, however, is no specific claim, nor is there any thing in the operation of the machine, as now patented, to distinguish it from other cylinder and concave thrashing machines.

For a machine for *Planing and Dressing Boards;* Melzer Twells, Milo, Yates county, New York, February 10.

A fare wheel is to revolve vertically, carrying four, or any other number of, plane irons, and close to the periphery are to be cutting bits, or hooks, to precede the double or single irons in their operation. The boards are to be held edgewise, resting against standards upon a suitable carriage, and held against the vertical standards by dogs. The plane wheel is to be driven by one band and whirl, and the carriage to be moved by another. This comprises all the information given, and there is not any claim. The plan has nothing in it having the remotest alliance to novelty, nor does it bear those features of maturity which would lead to the conclusion that it had been tried. The fact, is that as presented in the specification, it will not work well, and if it would, a patent could not be sustained for it.

For a *Machine for Shelling Corn;* Henry G. Neale, Poultney, Rutland county, Vermont, February 10.

A rubbing board, furnished with teeth, or cased with a toothed cast-iron plate, is made to slide horizontally in grooves, by means of a handle, a second rubbing being placed under it, and borne up towards it by steel or wooden springs attached to the frame. The claim is to the whole machine as constructed.

For a *Machine for cutting Straw, Hay, &c. &c.;* Chauncy D. Skinner and Danna Reed, Haddam, Middlesex county, Connecticut, February 10.

The specification of this patent gives a verbose description of the dimensions of the different parts of the machine, and ends by claiming "the combination of the various parts as described." The material to be cut is placed in a trough in the usual way, and the knife is fixed upon the face of a wheel revolving vertically; the shaft of this wheel has a crank on it, and is to be driven by the aid of a treadle, in the manner of a foot lathe. There is no feeding apparatus, or any thing of moment not pointed out by us.

For a *Churn;* Lyman Whittier, Vienna Kennebec county, Maine, February 10.

A churn, in the ordinary form of the vertical kind, is so hung as to swing backwards and forwards like a pendulum, there being a suitable frame to sustain it. A vertical shaft passes through the top, and runs in a pivot at the bottom of the churn; wings, or dashers, being attached to it to agitate the cream. A small cog wheel, or pinion, surrounds the vertical shaft, above the lid of the churn, and the teeth of this wheel take into teeth on a piece of timber, forming a rack, and attached to the frame, which, when the churn is swung, causes the shaft to revolve; the swinging may be effected by means of a rod, or other contrivance, attached to it for that purpose. The claim is to the mode of producing motion by the action of the cogs.

For a *Machine for Cutting Straw;* Joseph Evered, an alien, who has resided two years in the United States, February 10.

The description of this machine refers to the drawing throughout, and ends with a claim to "the finger wheels; the rising and falling of the rollers; the compression produced by the lever and weight; the concavity of the knives edges; the plan of the face of the wheel through which the straw is drawn; the centre screw on the worm and spindle, and its rise." The general form of the machine such as has been in use for more than half a century, the straw being contained in a trough, furnished with fluted feeding rollers, and the cutting effected by curved knives on the arms of a fly wheel, revolving at one end of the box; these curved knives, it will be seen, are claimed as new; if the inventor could go back as far as we can in the recollection of the use of curved knives, in a manner precisely the same with their employment in this machine, he would not place *himself* among the novelties of the day. There are other things claimed, which are in the same predicament, and where so many individual things are particularized, it is not easy to avoid such an error, as a few persons are fully informed of what has previously been done in those cases where machines have been long employed, as in cutting straw.

For a *Thrashing Machine;* Thomas Beede, Sandwich, Stafford county, New Hampshire, February 10.

This is a cylinder and concave machine, with some peculiarities about it upon which to found a claim, but not substantially different from numerous others of the same general construction.

For a *Cooking Stove;* John J. Giraud, Baltimore, Maryland, February 5.

The main improvement spoken of in the specification of this stove, is a *box door*, which is to answer the purpose of the ordinary *Dutch oven*, but what are the peculiarities of its construction we cannot discover, as it is mentioned in the specification in the most general way. There is a drawing, with letters on the respective parts, but we find no references to them, and most of the things represented have no novelty whatever. The claim is to "the door oven at the front of the fire place, as well as the general combination and structure of the entire instrument." The *door oven*, which is specially claimed, is to be dispensed with when the stove is used for warming only.

For a *Churn;* John E. Thomas, Winchester, Preble county, Ohio, February 12.

The body of the churn is to be a box, or case, through which two shafts are to run, furnished with slats, or dashers, passing between each other; on the outer end of each shaft there is to be a pinion, which is to be turned by a cog wheel; numerous examples of this churn exist in the patent office, and probably elsewhere.

For a *Horse Power;* Joseph Austin, Franklin county, Vermont, February 12.

No claim is made by the patentee to the construction of this horse power, and although such an omission is sometimes to be regretted, it, in the present instance, will not be productive of the slightest loss or inconvenience, a claim having been made thereto more than forty-one years ago, and a drawing and description of it having been given in the second volume of the Repertory of Arts, published in 1795. The plan is to obtain power by placing the animal near the top of a large, revolving drum.

For a *Washing Machine;* Luther Davison, Norwich, New London county, Connecticut, February 12.

A cylinder, the ends of which may be of wood, and the barrel part of zinc, is to revolve horizontally; round bars of wood are to reach from head to head, on its inside, standing at a small distance from its periphery, and allowing a space between each of them. A partition is also to extend across the middle of the cylinder, formed of similar bars, and dividing it into two equal parts. A door on the side of the cylinder allows the clothes to be put into either division of it.

"What I claim, is the arrangement of the bars in said cylinder, the partition of the cylinder, and the principle of washing the clothes in two separate parts of the same." A *principle*, the discovery of which will scarcely confer immortality.

For *Apparatus for Drying Cotton after it has been picked, &c.;* John Philbrick, Wilkinson county, Mississippi, February 12. (See Specification.)

For a *Machine for Shelling Corn;* Ira Smith, Downingtown, Chester county, Pennsylvania, February 13.

This machine does its work by means of a vertical revolving plate, constructed in the well known way of making such plates. The supposed novelty will appear from the claim, which is to "putting teeth or projections on both sides of the wheel, instead of on one side, as in the common method, thereby shelling twice as fast." It so happens, however, that this contrivance is old, having been patented some years since, and subsequently re-invented more than once.

For an improvement in the *Wheat Fan;* David Flanders and Calender Rathburn, Fort Covington, Franklin county, New York, February 13.

The general construction of this wheat fan is the same as those in common use, and although much pains have been taken to describe its individual parts, we are not told, and are unable to discover, in what its special utility and novelty consist.

For a *Machine for Cutting Sausage Meat;* Ambrose Henkel, Shenandoah county, Virginia, February 13.

The general construction of this machine may be inferred from the claim to "a cylinder with knives; secondly, their cutting between bars of any kind; and thirdly, the general construction of the machine." This claim is much too broad, the two first items in it not being sustained by their novelty, and not, therefore, sustaining the third.

From the Journal of the Franklin Institute.

EXTRACT FROM A REVIEW OF PROFESSOR DUCATELS' LAST REPORT OF THE GEOLOGICAL SURVEY OF MARYLAND.

[In the following article is presented an abridgment of the latter part of the Report. So much of the previous part as is connected with agriculture, was republished entire in the 5th No. of this volume.]

The report appears fully to establish the existence of green sand of the age of the New Jersey marl, in Kent and Cecil counties, and intimates that some of the members of the same formation have been discovered in the Potomac counties.

In the belief that the legislature which ordered the survey designed it as the means for developing all the advantages and riches of the state, for the benefit of every portion of the population, the geologist in prosecuting his labors, has endeavored to embrace in his report every prominent consideration of practical utility immediately or remotely applicable to the various interests of his fellow citizens.

In accordance with this understanding of his duties, he has labored, and it would seem successfully, in demonstrating to the agriculturists of Maryland, that they have within their reach the means of fertilizing and improving their soil to any desirable extent. Shell marl, green sand, oyster shell lime, are all readily attainable in their respective localities, whilst the unusual facilities of transportation afforded by the Chesapeake Bay and its numerous tributaries and inlets, afford to the farmers of both its shores, advantages, which are seldom equalled, and probably no where surpassed.

The cultivators of the soil are, it is said, already beginning to avail themselves of what has been pointed out in the former reports, and, if so, their practical experience will soon corroborate the scientific intelligence, which pointed out to them the sources of abundance and wealth so directly at their command.

One whole chapter of the report is occupied with considerations upon the agricultural resources of the lower counties, which is too voluminous for insertion in your pages; I therefore extract the following very interesting summary of them, intended by the author to direct the attention of his fellow citizens to the greater advantages which present themselves in their own fair territory, than may be found in the "far west" whither the restless spirit of emigration is fast hurrying a great amount of the population.

"Such are the agricultural resources of the lower counties on the Eastern Shore of Maryland, so far as the productiveness of the soil, and its susceptibility of improvement are concerned. It has already been stated, that the only incidental resource possessed by this section of country, is to be derived from the facilities of obtaining calcareous matter (in which the soil is essentially deficient) from the shell banks, oyster banks, and other sources already referred to. But before any hope can be indulged, that the inhabitants of this portion of the state will avail themselves of these means of bringing their lands into a higher state of cultivation than they seem to have any idea that they are capable of, it is necessary to remove a fatal impression, too generally made, that the lime derived from shells is of but little value. The result of the inquiries made to disprove this opinion, will be given in the next section of this report.

"An error equally fatal prevails among the citizens of Maryland, in reference to the counties that have just been passed in review—that they are as devoid of interest as they have been believed to be of resources. It is hoped that the minute, and, at the same time, faithful account given of them—more minute than would otherwise have seemed necessary—will have a tendency to rectify the false judgment so commonly passed upon this portion of our territory, and contribute likewise to cheer those of its inhabitants who have become disheartened at the present aspect of things, and who are too prone to believe that their industry could be better rewarded at a distance."

The immense heaps of oyster shells furnishing vast supplies of lime, has induced Prof. Ducatel to devote an entire chapter, to a comparison of the value of shell and stone lime—an opinion prevalent among Maryland farmers that the former was inferior, for agricultural purposes, to the latter, is satisfactorily refuted. The analysis of the respective kinds of lime, showed a decided advantage in the employment of *equal weights* of lime obtained from calcined shells, over that obtained from limestone.

The annexed extract furnishes a general summary of the comparison; it is preceded by a particular account of the analyses of ten specimens of limesone, from Baltimore, Harford, and Frederick counties.

"It will be perceived that three out of ten are magnesian limestones; all of them contain more silica or sand than has been found in oyster shells, and one, said to most extensively used in Harford county, contains as much as 11 per cent. of inert matter. It follows, therefore, that, as oyster shells are composed nearly of pure carbonate of lime, they will afford a lime containing scarcely an appreciable quantity of impurities. If well burnt, (which is the case when no effervescence is observed on treating them with a weak acid,) lime obtained from them may be deemed, with a fractional difference, equal, weight for weight, to the best stone lime; and as their chemical composition does not vary, there is nothing to be deducted from the value of the product in consequence of the impurities that exist, as exhibited by the foregoing table, in most limestones, and that must necessarily form a part of the residue when *these* are burnt.

If the comparative value of the two products be estimated by measure, a greater difference is discovered; but there is at the same time a disproportionate difference in price. A bushel of the best alum-lime weighs from ninety to a hundred pounds; whereas, the same bulk of shell lime, unground, weighs from sixty-five to seventy-five pounds, and perhaps when ground would weigh eighty pounds—a difference of from twenty to twenty-five per cent. But the former costs from thirty to thirty-five cents at Baltimore, the most convenient spot for its delivery on tide-water, where the latter can be had for ten cents; whilst farmers, conveniently situated on the bay side, might themselves burn the shells at an expense not exceeding six cents a bushel. These remarks refer to the lime obtained from recent or fresh oyster shells; but there is little or no difference between it and that procured by the burning of those contained in the Indian shell banks, provided proper care be taken to separate them from the black mould and dirt with which they are mixed.

It has been supposed, that because alum-lime has been found to admit of a greater mixture of sand than shell lime, in the making of mortar, it was to be inferred that it is correspondingly better, or, as it is termed, *stronger* for agricultural purposes. But this is an unwarrantable conclusion; for, as this circumstance seems to depend upon the peculiar aggregation among the particles of the lime, which prevents it from *setting* too rapidly, (or, in other words attracting water and carbonic acid from the atmosphere sooner than the wants of the mason require,) it would appear, on the contrary, that, if any inference is to be drawn from it, it is adverse to the conclusion; whilst, on the other hand, the fact that shell lime *sets very quickly* is favorable to the opinion, entertained by some persons, of its superior efficacy in agriculture—it being generally understood that lime acts in the soil in the condition of carbonate of lime. Admitting, however, that the peculiar arrangement of the particles in stone lime which renders it in general coarser than the lime obtained from shells, may better fit it as a mechanical amendment to certain soils, the difference is at most as one to three, according to the datum upon which its superiority is predicated; namely, that in the preparation of mortar, stone lime will bear three times as much sand as shell lime. But even in this respect the conclusion is not warranted, except perhaps in the case of a purely sandy soil, in which lime *alone* would, it is believed, prove of little service."

The discovery of green sand forms an important epoch in the agricultural history of the state, on account of its value as a manure; and a considerable space is devoted to its consideration. The author combats the opinion expressed in the Farmers' Register, that the fertilizing properties of this marl, are due to the sulphate of lime which it contains, and attributes them, with much reason, to the potassa found by analysis to exist in it, adopting thus, the conclusion of Prof. H. D. Rogers, in regard to the Jersey green sand. The geologist's account of this interesting formation, as well as that of the *micaceous black sand* associated with it, will well reward a careful perusal.

The greater portion of the report is occupied with an examination of the three lower counties of the Eastern Shore of Maryland, but there is a chapter containing a "Geological Examination of St. Mary's county, in reference to its agricultural resources"—and a number of localities of shell marl or fossiliferous deposites are pointed out which may be made available. The gypseous clay mentioned in the first report, is also alluded to as doubtlessly affording a valuable agricultural resource. In addition to the marl, St. Mary's county also possesses the Indian Shell Banks, already referred to as existing in the Eastern Shore counties.

Under the title "Progress of the Geological Survey of the State" the geologist, gives a detailed account of the extent of country visited by him during his tour of duty. Twelve of the nineteen counties of the state have been visited, and six of them, it is said, thoroughly examined so far as the purposes of the survey appear to require.

It is believed that this brief sketch of the contents of the report, will suffice to justify the assertion made at the commencement of this notice, that the industry, skill, and scientific attainments of the gentlemen employed by the state of Maryland, are such as eminently qualify them to execute the task which they have undertaken. And should the citizens of that state duly appreciate and employ the resources at their command, prosperity and wealth will abound in situations where the soil has been hitherto deemed as of but little value; the same rich treasures being within their reach which were so long unknown in the state of New Jersey, and which, since their value has been known, has caused the wilderness to blossom as the rose.

It appears from information which may be relied on, that the able manner in which Prof. Ducatel has discharged his duty, and the judicious construction which he has placed upon the intentions of the legislature, have already much more than repaid the expenses which have or will attend the examination. Lands have risen in value, new products are beginning to be obtained from the soil, and instead of exhausting its fertility by continued cultivation, without the attempt at renewing it, the means pointed out have been resorted to, by which it may regain its original vigor, and even the "old fields" again become laden with harvests. From present indications, it appears almost certain that the splendid schemes of Internal Improvements, now projected by the state of Maryland, will be carried into operation at a very early day, thus affording the means of communication throughout the larger portion of her territory. The fruits of the husbandman's labor, and the mineral treasures from the mines, with which she appears to be liberally supplied, will thus find a ready market. And we may fairly hope that when the blessings which must result from such improvements are fully experienced, it will not be forgotten that a large debt of gratitude will be due to those branches of science, without whose aid the hidden treasure would never have been brought into view; and that a flourishing community will, in its turn, contribute liberally to their further advancement.

From the Farmers' Series of the Library of Useful Knowledge.

GREEN CROPS FOR MANURE.

Green manures consist in full crops of succulent plants—such as buck wheat, rape, tares, and many others—which are ploughed into the land, and have been applied in many instances with very singular advantage, more especially on calcareous, gravelly, and sandy soils, the fertility of which has been thus greatly improved. The practice dates as far back as the time of the ancient Romans, and is still continued throughout Italy, even in places where the dung of animals can be procured in abundance. The climate of that country is, however, more favorable than ours to the system, for the corn harvests are so much earlier, that they are off the ground in time for succeeding green crops to arrive at full maturity; and it is there thought that nothing tends more to the improvement of the land than ploughing them down.[*] It has indeed been held by many intelligent men who support an opposite opinion, that the land which produces these crops will be deprived of their vegetative properties in proportion to their luxuriancy; and, therefore, that, by returning the crop into the same land, its fertility only be increased in the same degree as it was reduced by their reduction. This theory, however, can only be supported upon the principle that plants are fed more by the soil than by the atmosphere; whereas it has been shown, by many curious experiments, that the air and water are the chief sources of vegetation; and it is a fact, that poor land, without manure, which by the fortuitous chances of the weather has produced tolerable green crops, has been found more fertile after their production than before.

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[*] In Tuscany, the plant which is chiefly sown for this purpose is the white lupin, a leguminous annual plant well known in our gardens, which grows in sandy and loamy soil, to the height of two or three feet, with a stem of equal strength with the bean, and bearing somewhat similar blossoms and pods; but the produce is so bitter that it is unfit for the nourishment of either man or beast, until prepared by some manufacturing process. It arrives to a considerable size in the month of October, when it is ploughed into the soil; and very extraordinary fertilizing properties are attributed to its effects, which are ascribed to the great quantity of gluten which it is known to contain. Whether it might be brought in this country to a sufficient degree of maturity for that purpose, as a field crop, we have no means of judging; but it may be worth the experiment.—*Simonde, Tableau de l'Agriculture Toscane*, p. 72.

When ploughed into the land, they however often remain for several months, before they decay, for their decomposition goes on slowly beneath the soil, and they are therefore frequently more beneficial to the second than to the first crop. To turn them in effectually, they should be first heavily rolled, and then followed by a trench plough, for the operation cannot be completely performed with a common plough; and, if not entirely buried, their points stick out between the furrows, by which they are partly prevented from fermenting, and a portion of their value as manure is thereby lost.

The *time of the year* when they should be ploughed in, must, of course, depend upon the nature of the crop, which should always be buried before it arrives at perfect maturity, or otherwise it will rob the land of that nutriment with which it is intended to supply it. Most farmers take the first growth of tares and clover, which, if fed off early, is an economical plan; but if mowed, it is only doing the business by halves, for the land is thereby not only deprived of the dung of the cattle, but the operation is then too long delayed, for the work should be done in the heat of the summer, or, at the latest, early in the autumn, while the sun has the power to forward the fermentation. The effect, indeed, will greatly depend upon the season, for the process of fermentation is only slight when checked by the want of free communication with the air; and if the weather be cold, the power of the manure will be in a great measure lost; but if the season be moderately moist, and very warm, the fermentation will be much promoted, and the crop will be converted, by putrefaction, into a mass of nutritive mucilage. Nothing short, however, of an abundant crop will have that immediate effect, as a large mass decomposes much more speedily than a small one; and, if very scanty, the latter perhaps may not putrefy at all, or its decomposition will be so very gradual that the land will be very little perceptibly the better; but if such a quantity be turned under the earth as will excite the force of fermentation, there can be no doubt but that it will then be greatly as well as promptly benefited. Sir Humphry Davy, indeed, says, "that this gradual decomposition affords a supply of vegetable mould for several years;"* but although, as a chemist, he may be right, yet every practical farmer must know that, with such materials to work upon as cannot materially enrich the staple of the soil, his object should be to obtain such immediate effect as will enable him to put the land into a state for growing one good crop, which by its means of producing manure, will probably lead to others. If the question whether it be most profitable to appropriate green crops as the food of cattle, or as manure, be put aside, and that the sole object is the improvement of the land by the latter process, then there can be little doubt that the crop should be ploughed down as soon as it is in bloom, for the land will thus have its full benefit, besides the partial advantage of the bastard fallow; to which, however, there is this difficulty opposed—that the ground cannot be again ploughed until it receives the seed furrow, and therefore cannot be cleaned except by the operation of horse-hoeing, or scarifying, which, if the soil be foul, we need not say will prove ineffectual.

The *crops which are most generally applied to this purpose* are—buckwheat, winter tares, the second year of clover, and rape; which last, from its oily nature, has been found very effective. There is, however, a plant which, although but seldom sown in this country, is very commonly grown throughout Flanders, for the pasturage of cows, and is there sown, like brush-turnips, immediately after a crop of wheat, yet in a couple of months afterwards affords a large quantity of succulent food. Several trials of it have also been made with the happiest results in many parts of Germany, of its effects as a green manure; for it not only possesses the advantage of putrefying with great rapidity when ploughed in, but also that of producing a crop by being merely harrowed across the stubble, and the seed costs a mere trifle;* it is called *spurry*.† Out of a number of trials which have been recorded in this country, we select the following from the Essays of Mr. Burroughs on green crops and on manures:—

Experiments.

1. A field of strong clay, containing three acres, on Mr. B.'s own farm, was laid out in the following manner. One acre was fallowed during the summer, and prepared for wheat with sixty barrels of lime, harrowed in; the adjoining acre was sown with winter tares, which were once cut, and the second growth turned into the land when the blossom appeared; the third acre was planted with potatoes, and manured with farm-yard dung. The entire of the field was sown with wheat the first week in November, at which time the acre sown with tares was much cleaner and in better health than those planted with potato or fallowed, and the following year produced more wheat, and of better quality, than either of the former. After the wheat crop was carried off, the field was immediately ploughed, and in the following May sown with barley and grass-seeds. The average of the corn off the three acres was nearly the same; but the meadow, the following year, produced more abundantly off that part of the field where the tares had grown, and the land was much freer from weeds.‡

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* Elements of Agricultural Chemistry, 4to. p. 244.

* Annales de l'Agriculture de Basse-Saxe: 3me année, sect. 1re.

† See also Lord Dundonald's Treatise on Agricultural Chemistry, regarding the cultivation of *sorrel* in poor worn-out soils, for the purpose of a green manure; in which its application to the land along with lime is strongly recommended upon grounds which are well worthy of attention, but too long for insertion here.

‡ Essay, No. I. On the Cultivation of Green Crops, p. 29.

2. After many ineffectual trials made by a very experienced farmer, in Herefordshire, to produce a crop of wheat off a field which had been several years in cultivation, he sowed winter tares as a fallow crop preparatory for wheat. The first growth of tares was mown for soiling, and the second ploughed in for manure; yet, even under this management—of soiling, instead of feeding on the land, and of ploughing in the second, instead of the first, crop of tares*—the wheat afterwards produced was superior to any corn-crop he had ever obtained off the same field.

3. On part of a ley-field, in the country of Kilkenny, the tops of a crop of turnips on an adjoining close were cut off and spread upon the sward before it was ploughed up, after which the entire field was sown with oats; but the crop on that part of the field where the turnip-tops had been ploughed in was so materially better, that it produced one-third more in proportion than the rest of the ground.†

Mr. Burroughs also says, in a communication to Sir John Sinclair, "that he has often laid down land with vetches and grass-seeds, and has not only observed that they retain their fertility much longer than when sown with oats or barley for that purpose, but that he has known grass-seeds which have failed when sown with oats, to have succeeded when sown with vetches:" from which, and other experiments, he expresses himself satisfied that "the ploughing-in of appropriate green crops is a cheap, effectual, and profitable mode of improving exhausted or light soils."‡

On this we so far agree with him, that upon arable land which, from any circumstance, is deprived of the benefit of a due application of farm-yard dung, or other putrescent manure, there can be little doubt that green crops of quick growth, abundant foliage, and easy decomposition, may be turned into the land with considerable advantage; but we cannot accord in his opinion that they will be found an effectual mode of improving exhausted soils, for on such land they grow too feebly to produce much effect. The ground, to be benefited by their application, should be capable of bringing them forth, if not luxuriantly, at least with such abundance as to furnish complete shade during their growth, and sufficient vegetative matter to occasion a rapid fermentation when buried: we therefore conceive that this species of manure is more appropriate for the preservation of good soils in a state fertility, than to the improvoment of those which are impoverished. This probably will in a great measure account for the comparative rarity of the practice on extensive farms containing tracts of poor land, the cultivation of which is chiefly dependent upon the fold; while, on those of a richer description, it may be fairly questioned whether the dung made from a large green crop, when fed off, or soiled, may not be equally beneficial in its effects upon the soil as if ploughed down, besides the superior profits thus gained by its support of the stock.

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* It is well known that unless tares are cut at a very early stage of their growth, there is no second crop.

† Essay, No. II. On Manures, and their Application, pp. 85 and 86.

‡ Sinclair's Code of Agriculture, 3d ed. App. p. 66.

Communicated for Publication in the Farmers' Register.

HUSSEY'S GRAIN CUTTER.

Report of the Board of Trustees of the Maryland Agricultural Society for the Eastern Shore of Maryland, on the machine for harvesting small grain invented by Mr. Obed Hussey of Cincinnati, Ohio.

The favorable accounts of the operation of this implement in several of the western states induced the Board to invite Mr. Hussey to bring it to Maryland and submit it to their inspection. It was accordingly exhibited in Oxford, Talbot Co. on the first of July in presence of the Board and a considerable number of other gentlemen. Its performance may justly be denominated perfect as it cuts every spear of grain, collects it in bunches of the proper size for sheaves, and lays it straight and even for the binders. On the 12th of July a public exhibition was made at Easton, under the direction of the Board—several hundred persons principally farmers, assembled to witness it, and expressed themselves highly satisfied with the result. At the Trappe where it was shown by the inventor on the following Saturday, an equal degree of approbation was evinced. It was afterwards used on the farm of Mr. Tench Tilghman where 180 acres of wheat, oats and barley were cut with it. Three mules of medium size worked in it constantly with as much ease as in a drag harrow. They moved with equal facility, in a walk or a trot. A concise description of this simple implement will show that it is admirably adapted to the important purpose for which it was invented. Resting on two wheels which are permanently attached to the machine and impart the motion to the whole, the main body of the machine is drawn by the horses along the outer edge of the standing grain. As the horses travel outside of the grain it is neither knocked down or tangled in the slightest degree. Behind the wheels is a platform (supported by a roller or wheel) which projects beyond the side of the machine, 5 feet into the grain. On the front of the edge projecting part of the platform is the cutter. This is composed of 21 teeth resembling large lancet blades, which are placed side by side and firmly rivetted to a rod of iron. A lateral motion is imparted to it by a crank, causing it to vibrate between two rows of iron spikes which point forward. As the machine advances the grain is cut and falls backwards on the platform, where it collects in a pile. A man is placed on the part of the platform directly behind the machine, and with a rake of peculiar construction pushes off the grain, in separate bunches, each bunch making a sheaf. It may appear to some that the grain will accumulate too rapidly for this man to perform his duty. But upon considering the difference between the space occupied by the grain when standing and when lying in a pile after it is cut, it will be evident that the raker has ample time to push off the bunches even in the thickest grain. In thin grain he has to wait until sufficient has collected to form a sheaf.

The machine [is] driven around the grain, which may be sown either on a smooth surface or on corn ridges. For the first round, a way may be cleared with a cradle; but this is deemed unnecessary; for the grain, when driven over, is left in an in clined position, and by cutting it in the opposite direction, as much of it is saved as with a cradle. Fourteen acres in corn lands were cut between 10 A. M. and 7½ P. M. The hands had never worked with the machine before, nor was it a trial day's work. For owing to the shortness of the straw, the machine was not allowed to cut when passing over the ridges from one side of the ground to the other, and this time was consequently lost. From the principle on which the cutting is performed, a keen edge to the cutter is by no means essential. The toughest weeds, an occasional corn stalk, or a stick of the thickness of a man's little finger, have been frequently cut, without at all affecting its operation: it can be sharpened, however, in a few minutes with a file. The width of the swath may be increased by having the cutter made longer, and the same machine will cut a stubble of several different heights.

There is ample room to make the different parts of any size, though the strength of every part has been fully tested. The machine has been often choked by oyster-shells getting the into cutter, in attempting to cut too low a stubble. The motion of the machinery being checked, the main wheels slide on the ground, the strain on every part being equal to the power exerted by the horses. It can be managed by any intelligent careful negro. We deem it a simple, strong, and effective machine, and take great pleasure in awarding unanimously the meritorious inventor of it a handsome pair of silver cups.

ROBT. H. GOLDSBOROUGH,
SAMUEL STEVENS,
SAML. T. KENNARD,
ROBT. BANNING,
SAML. HAMBLETON, Sr.
NICHL. GOLDSBOROUGH,
ED. N. HAMBLETON,
JAMES L. CHAMBERLAIN,
MARTIN GOLDSBOROUGH,
HORATIO L. EDMONDSON,
TENCH TILGHMAN.

From the Genesee Farmer.

HESSIAN FLY AND WHEAT INSECTS.

Good entomologists are few in proportion to other cultivators of the sciences. When their attention is directed therefore, to such insects as interfere with our rural economy, and successfully point out to us practicable methods for counteracting such invaders of our rights, we are always thankful—though we have to regret that *to be useful* seems to have occupied less of their attention than the interests of gardening and agriculture demand.

The following extracts are from a letter which we lately received, and were written by one who has looked closely into such matters. We only add that he is a practical farmer.

"The Hessian fly and wheat insect, both belong to the same genus, called *Cecidomyia* by modern entomologists. *Tipula* I believe was the old genus from which the former was separated.

* * * * *

"The best and most interesting part of the story has not been told :—The Hessian fly is destroyed by a minute but formidable enemy, called the *Ceraphron destructor* by Say; and the wheat insect by *two* enemies that destroy it in the same manner as the Ichneumon does the caterpillar. [That is to say, they deposite their eggs in the skin, and the larvæ which hatch out from those eggs, then feed on the living caterpillar, or wheat insect, till they destroy it.]

"I see no good cause for alarm, either on account of the hessian fly or of the wheat insect, as both are are thinned by their winged enemies, sometimes nearly extirpated. If our winter had been an ordinary one, we should have had tolerable crops of wheat in despite of the fly. The more I become acquainted with the habits and manners of insects, the more I have to admire the wisdom and goodness of God as manifested in the creation."

From the New England Farmer.

SILK CULTURE.

From the correspondence of Gen. Tallmadge, it appears.

1. That one great source of the national wealth of France, is the product of the vineyard, under the culture of the husbandman—and the silk worm under the fostering care of the wife.

2. That in Italy, partially, and chiefly in France, the culture of silk is carried on by private and individual industry.

3. That a damp climate is injurious to the silk worm—and that the culture of silk does not prosper *near the ocean.*

4. That France does not produce one half of the raw silk which she manufactures. *Her population* is so dense that she cannot *furnish* sufficient space for mulberry trees.

5. That the warm dry summers of the inland parts of the United States are admirably fitted for the culture of silk in families, and that we shall succeed in it. *That when the leaves of different kinds of mulberries are mixed together, the worms will select and gather the Chinese mulberry.*

6. That in Europe the mulberry trees are cut off and kept dwarfed, for the convenience of gathering leaves.

7. That although the Chinese mulberry is vastly superior to any other for feeding silk worms, yet from the inaptitude of French farmers to change habits, there are comparatively but few of the Chinese mulberry set out in France. At this time there are probably growing in America more Chinese mulberries than in all Europe. Even after the experience of ages, Europeans are said to act more from usage and habit, than skill and experience. The demand for mulberry in America is so great, that the French this year have sold us 100 trees where they have set out 10 for their own use.

From the Genesee Farmer.

ACID IN WOOD—ITS EFFECTS ON SALT AND BUTTER.

It has been frequently remarked by those who are in the habit of packing butter, that that kept best put down in stone, the next best in oak or white ash firkins, the wood of which had been boiled for several hours previous to working, and that butter packed in firkins made of unprepared wood frequently acquired a strong and disagreeable flavor, which seriously injured its quality. The reason of this has not been generally understood. Mr. Moir, of Scotland, has been instituting a series of experiments on the subject, which appears to have thrown some light on the matter. He found that most kinds of wood contain considerable quantities of *pyrolignic* acid, which decomposes the salt with which it comes in contact. The *Linden*, or basswood, was the only wood he found entirely free, but the other kinds he experimented upon were easily freed from the acid by boiling three or four hours, well pressed under water. It is evident that firkins made of staves prepared in this way would be decidedly improved, and as the preservation of butter in a sweet and pure state is an important matter to the dairyman, we think much would be gained by a proper attention to the vessels in which it is packed.

The fact that wood in general contains large quantities of pyrolignic acid is no new discovery, or its injurious effects upon salt unknown. At the large salt works in the Austrion Tyrol, the water as it flows from the springs is too weak to be profitably boiled. To raise it to a proper degree of strength recourse is had to evaporation. This is effected in immense buildings, very high, and filled from top to bottom with closely pressed faggots of fine brush. The water is conducted to reservoirs in the top of these buildings, and thence is distributed in such a manner as to fall through the whole mass of faggots to the bottom, where it is received into cisterns or reservoirs, from which it is conveyed in pipes to the places for boiling. In this process of percolating through the brush, it is found to gain in strength nearly one half, or rather from the immense surface of the water exposed by this method to the action of the air, the evaporation is so rapid that this effect is produced. It was found that different kinds of brush had very different effects on the quality and quantity of salt produced, and some after repeated experiments were pronounced entirely inadmissible. Those that contained the least acid were found universally the best, and at the present time little besides the fine twigs of the linden is used for replacing such faggots as at very distant intervals of time it becomes necessary to remove, the salt giving them, by its constant and thorough saturation, an almost unlimited duration.

G.

ON THE IMPROBABILITY OF THE LEGISLATURE AIDING THE IMPROVEMENT OF AGRICULTURE.

To the Editor of the Farmers' Register.

September 20th, 1836.

Mr. Editor:—Although I was much gratified, upon the whole, by the perusal of Col. Gooch's two numbers in your last Register, and agree with him entirely, that " legislative action is required," (nay, *imperiously* required,) " in aid of agriculture;" yet I differ from him altogether, in the opinions and hopes expressed at the end of his second number. To utter this dissent is my present purpose, and in a way which, I trust, will not be displeasing, either to you or himself, however hardly it may possibly be thought to bear on some others.

In speaking of the agricultural community, Col. G. remarks. " *That* community can not be expected to acquiesce much longer in delay and indifference," &c. Now, if coming events can be predicted, with the least certainty, from those which are past, an acquiescence which has lasted, and with the most exemplary patience too, ever since the government existed, may very reasonably be expected to endure for ever. Sir Robert Walpole once compared our class to sheep, who always submitted to be sheared without resistance, by any who attempted it, as often and as closely as they pleased; and if ever there was a country whose agriculturists verified the remark, our old state, (God bless her,) is that one.

In the next sentence Col. G. adds, "But my confidence in the patriotism of the legislature, and in their disposition to do any thing for the public good, when they see clearly how it may be done, is such, that I am sure the members will, between this and the time of their meeting, reflect seriously on, and inquire into this vital subject, and be prepared to legislate wisely and efficiently upon it."

This kind of confidence is, without doubt, very comfortable to him who feels it, as well as agreeable to those in regard to whom it is uttered. I regret therefore that I cannot concur in it. Nay, even in Col. G. himself, I must believe that it is prompted rather by long deferred, unfounded, but still fondly cherished hope, than by any experience on his part—any recollection of a solitary enactment favorable to agriculture, passed by a Virginia legislature, since our separation from Great Britain. *No such enactment* being in my recollection, and judging of the future by the past, I can feel *no such confidence*, and am consequently destitute of all hope on the subject of " legislative action in aid of agriculture."

It is true, Col. G. has guarded himself pretty well against the charge of being too sanguine or credulous in his anticipations of this aid, by limiting their fulfilment to the time "*when they*," (the legislature,) "*shall see clearly how it is to be done.*" I also shall expect them to be fulfilled, should this ardently to be desired "*when*" ever come. But as clearness of vision in regard to the great and vital interests of agriculture seems never to have been an attribute, either required or manifested in Virginia legislators, I cannot say more of it, than that I shall always be prepared to hail it as a God-send, if it ever should be exercised in our behalf. Until then, I can entertain no hope, nor even shadow of expectation, that the mental eyes of our law-makers will ever be directed towards the means of agricultural improvement and prosperity; still less, that any laws will ever be passed to promote them.

In conclusion, permit me respectfully to suggest, not only to Col. Gooch, but to all the rest of our brethren, never more to look for legislative aid to our class, until we can prevail on ourselves to choose agricultural patriots to represent us, rather than political party prize-fighters, and makers of presidents and vice presidents. Never more to ask any thing for agriculture, until political party battles and political party victories shall certainly have ceased to be deemed matters of such paramount, such very superior importance to the great agricultural and commercial interests of the country, as to render the qualifications for fighting those battles and achieving those victories, the only prerequisites in choosing our legislators. If we demand not good moral character, good talents well cultivated, and statesman-like qualities, as indispensable qualifications in our legislators, is it not something far worse than preposterous folly, to expect salutary laws from any body of men whatever, chosen, if not without any reference to such endowments, at least with a public and general understanding that zeal and skill in party-warfare will be deemed immeasurably more valuable, than all other qualifications put together. The natural, nay, the inevitable consequnce must be, if the people themselves *will act* upon such anti-patriotic principles, that their representatives *will deem it* both their interest and their duty to pursue a similar course. Away then—forever away with agricultural and all other interests, but those of political party, which, from their very nature, must be partial, monopolizing, and exclusive. We have no middle course between a faithful and undeviating adherence to our own interests, as inseparably connected with those of the American people, and the demoralizing, distracting, and baneful interests of political party, which, (call it by what name you please,) will always make the national interest subservient to its own, although the promotion of the former is ever made the pretext for the most unhallowed and iniquitous of its own proceedings. That we never have had any active, efficient friends to agriculture in our legislature, is, unquestionably our own fault; and so long as it remains so, we should blame none but ourselves for that deplorable neglect and consequent depression of all agricultural interests in Virginia, which is so rapidly desolating every part of her territory, that those called neighbors, will soon live too far apart even to hear each others' dogs bark. But the remedy for this shameful, most ruinous legislative neglect, is not any longer to degrade ourselves by annually begging for what we have a right to demand. No, let us never again expose ourselves to such humiliation, but endeavor, with our utmost zeal and perseverance, to devise some ways and means among ourselves, to resuscitate our fast sinking agricultural interests, and secure for them that permanent prosperity, which is indispensably connected with the national welfare as its most essential procuring cause. The next Agricultural Convention will furnish a good opportunity for the incipient steps towards the accomplishment of this most desirable object, provided it be as fully attended as it ought to be: much more fully, it is to be hoped, than the first, for that proved any thing but encouraging to the true friends of the cause. By the way, would it not be better to meet on the 2d Monday in December, than the 2d Monday in February? The weather then, will probably be better; and if any members of the Legislature should also be members of the convention, they will be on the spot to attend, whereas, before the 2d Monday in February, the Legislature ought certainly to adjourn—even if instead of taking the ten-hour prescription for official labors, they will work only five per day, in matters exclusively of legislative duty. This would be a truly gratifying spectacle to every real friend of the Ancient Dominion; but that you, or I, or any of our descendants to the third and fourth generation will ever see a Virginia Legislature thus patriotically employed—should public sentiment remain what it is in regard to the true and essential duties of legislators—is deemed an impossibility—at least by your old friend

COMMENTATOR.

[Our correspondent is mistaken as to the time for the second meeting of the Agricultural Convention. It was appointed to be held on the second Monday in January: and we take this occasion to call attention to the matter, and request all belonging to the agricultural interest to bear it in mind, and have delegates sent from the existing agricultural societies, and from public meetings where no such societies have been formed.—ED.]

ON PATENTS FOR INVENTIONS.

To the Editor of the Farmers' Register.

* * * * *

You complain of John Bull running away with American inventions. The old fellow, as long as I can remember, has been said to improve, and to leave to others the trouble of inventing. But, is it not to be expected that this will always be the case, when in a community so small as is this, there should be such a want of community of feeling—a liberality so limited, or rather an illiberality so illimitable? And, as I am now on the subject of improvements, I will just suggest a practical illustration of what, in my opinion, would be an improvement as to new inventions of the lesser, though not less beneficial, order. The Society of Arts in London, on condition that the owner of the improvement of this class, will forego the patent, will give him a certificate of its value, and this giving it a character, is, I think, *generally* found to be an equivalent. If the Franklin Institute were to act thus, the patentees would be exchanged for owners of legitimate and real improvements; and in such populations, as those in which they will become popular, will receive a full equivalent, and the public would be preserved from much fraud—especially in washing machines. The deception in this hoax is enormous; and, when it is considered that J. C. Curwen, of Cumberland, as early as 1802, had all the clothes of his farm steamed without rubbing, the trick is still more remarkable. (*Vide* his Agricultural Hints.)

But, by the recent patent law, I see in the tariff of rates, John Bull is to pay $500; any other foreigner $300; and the citizen but $30. As to foreigners, they will cheerfully submit; as, if a patent is not worth $500, it is not worth a *sou*: but I cannot otherwise than believe that, as the *caveat* principle is, I apprehend, for the first time put into practice, it would be better to charge $300, $400. or even $500 *to every one*—especially, if for lesser objects, the Franklin Institute could be induced to act, and the owners to acquiesce. The fund created by the increased charge, might accrue for the benefit of distressed, although successful, inventors, (a class too often to be found,) or be disposed of in any useful manner—to the descendants of such men as Fulton or Whitney, for instance.

But, as to charging forigners more than natives, it is to me inexplicable, except such is the case in other countries with American citizens. If it is so, I am ignorant of the fact. However, I should very humbly think, that where, as in the case of the United States and Great

Britain a reciprocity treaty existed, it was contrary to law. An American ship pays the same pilotage as a British vessel in the United States—and *vice versa*: but the amount of the charge rests in the breast of the proper authorities in both countries. The pilot charge in New Orleans, and in Calcutta, are, I suppose, greater than in New York and the British channel. These depend on the local authorities, and these authorities do not look to the amount, but to the value of money; and it would be hard indeed if a Mississippi or a Hoogly pilot should be compelled to labor for the same *amount*, as his brother in New York or the channel. In short, equality in charging the citizens of both countries, is the basis of the treaty; and how, because Great Britain taxes a patentee from the United States £100 or $480, which is just what she taxes her own, the United States can acquire a right to create an equality of principle, I am at a loss to discover. It would be hard, if the government of the United States charged $1000 for a patent to a citizen, that the British Minister should merely, on that account, increase his $480 to $1000.

G. L. C.

From the New York Journal of Commerce.

PRICE OF BREAD-STUFFS.

We would not needlessly interrupt the enjoyments of those who look forward to the next winter as a time of general starvation. But lest their dreams should be too suddenly broken, we must call their attention to the facts contained in the last news from Europe respecting the prices of bread-stuffs there. We happen to know of an operation at Liverpool, by which fifty thousand bushels of wheat are to be immediately forwarded to this country, and by the prices which are published, there is little doubt that much larger supplies will be soon forthcoming; for the long continuance of high prices, the successful issue of the recent importations, and the fact, well ascertained, that our domestic supplies are inadequate to our wants, will give new confidence in future operations. Let us see at what prices we can be supplied.

In Paris the price of bread is about 2 cents, and in London 3 cents per lb. We found a shilling loaf in New York yesterday to weigh 2 lbs. 3 oz. which is 6 cents per lb. The price of wheat in Paris is 112 cents a bushel, and the price of flour $5 a barrel. In London flour is $8 per barrel. In the ports of the Mediterranean and of the Baltic, bread stuffs are much cheaper than in either London or Paris. The price of good wheat at Naples is 2s. 10d. sterling a bushel, or 67 cents. From any one of these places freight might be obtained at 33 cents per barrel on flour, and 12½ cents per bushel on wheat, or about half the rate charged on transportation of the same articles from Rochester, and one fourth of what is charged from Ohio by one house, at a freight of 49 cents. The duty on flour is one dollar a barrel, and on wheat 25 cents a bushel. Wheat, therefore, can be imported from Naples and laid down in New York at 125 to 135 cents per bushel, all charges paid, and a hundred other places at the same or a less price. Corn and rye are not burdened with a duty, and may be imported to great advantage. The countries of Europe and Asia afford stores of bread stuffs almost inexhaustible, so that the supplies for this country, if they should run to the highest possible quantity, could only affect prices in a very slight degree. Free trade will supply all our wants, and the cost, with a little mercantile profit, will not carry prices above 150 cents for wheat, 100 cents for rye and Indian corn, 50 cents for oats per bushel, and $7 50 for flour per barrel. So let the desponding cheer up, for no one who is industrious and frugal need starve in 1836 or 1837.

For the Farmers' Register.

PRICES OF GRAIN, &c. &c.

Sir—I had scarcely read, with a delight that I am unable to describe, the observations of Taylor of Caroline, on the effect of the funding system, when I encountered the "free trade" doctrine of the Journal of Commerce. Its object was, (after showing that bread was 6 cents per lb. in New York, 3 in London, and 2 in Paris, and that wheat could be had for 67 cents in Naples,) to prove, that if "free trade" (and a long south-west wind, I suppose) was to continue, there would be no danger of starvation in the cities and rural districts of the United States. What is to be done, if owing to bad harvests, or any other cause, Europe should become its own consumer, and cease to be able to export, the sage writer of the paragraph has not deigned to say. But this language more than ever convinces me of the utter futility of the doctrines of political economy, and the *doctrine* so often repeated, and I am almost tempted to say as often refuted by practice, that things will find their own level. Let war be undertaken, or foreign dictation tamely submitted to, because you are literally unable to sustain a contest—and perhaps the corn laws of Britain, and the protection of the agriculturist, will not appear so absurd. But what is the cause of this state of things? The mania for stock jobbing, for banking, for speculation—and much of this based, as is now clearly proved, on fraud and forgery.

The "empire state" boasts of its progress. Virginia and the south, lament their relative decline. Is it to be wondered at, when we see the hot bed system of the one, and the simple cultivation of the other? The southern states are sinking, when the others are rising. Is there no remedy? There is. And it is to be found in the employment of such methods as the youthful state of Georgia has used, in the creation of means, to place within her borders the arsenal of the south, and lay down a rail road from the Atlantic to the Gulf. For while the south has been talking about a scheme, as visionary as its founders, and as impracticable as it is expensive—the forcing the port of Charleston into the position of the emporium of the south—while this has been a subject of speculation, inquiry, and declamatory flummery, what has not Georgia done? She has employed a talented and patriotic member of congress to urge her suit—display the advantages of her patriotism, and has succeeded, comparatively at a blow, in procuring $2,500,000 from the city of Boston, for the purposes I have mentioned. Thus, the name of *Thomas Butler King* will be rendered celebrated, and well worthy of envy and admiration: but perhaps no less so than the capitalists who have contributed to the fund. Perhaps the sages who projected the rail road to the Ohio. from the Atlantic, and excluded Georgia from "our charter," will now see their folly, and lament their stupidity—especially, if uniting in action, and avoiding the difficulties of complicated legislation, Georgia, Kentucky, and Tennessee should combine, and thus producing co-operation with Virginia, create two outlets, the effect of which, will be to exclude South Carolina from any of the benefits, which, from her language, she so anxiously desires—and this at the very instant when the latter has, in Beaufort, a port more capable of becoming a man of war harbor, and better situated than any other on the Atlantic, south of Norfolk. However, I may seem to be wandering from my subject; and hence, I am led to say that, as a road to market will be one of the best methods to protect agriculture, Virginia, Kentucky, Tennessee, the Carolinas, &c. &c. should, if possible, follow the example of Georgia. Hence, let agents be despatched to Philadelphia, whose intelligent capitalists will doubtless follow the example of Boston and ascertain whether, with her present capital, as much could not be had as would carry the desired objects into effect. The commercial influence she would obtain would be incalculable. I say her *present* capital, to prevent the necessity of such a redundancy of issue as has already inflicted so great a punishment on the country—and on the effect of which, there is too correct a picture to be found in Col. Young's reply to those who ask him to become a candidate for the government of New York. Well, very well, do his opinions verify the sentiments in, I think, No. 12 of Taylor's *Arator*, to which and to his notes, I beg the earnest attention of your readers and yourself. Well does Col. Young observe—

> "Whilst legislation is directed, as it ever should be, to the greatest number, laws will be few and simple; but in proportion as it is perverted to the corrupt subserviency of stock-jobbers, speculators, and monopolists, will it become more intricate, protracted, and multifarious. When the immutable truth is fully understood, that there is no possible way of *creating* wealth but by productive labor, it is perfectly apparent that the gains and speculations of the profits of monopolists are extortions upon mankind, in which the few participate at the expense of the many.
>
> Occupied with their private concerns, the great mass of mankind do not always bestow sufficient attention to watch the silent operation of laws, and to trace the connexion of cause and effect. Little by little the aggressions of power steal unperceived upon the body politic, like the debility of age upon the human frame. Twenty years ago, the legislation of the last session, if it could not have been otherwise averted, would have roused the whole community to arms. The undeniable truth that all men are born free, and have equal rights in the enjoyment of life, liberty, and the pursuit of happiness, was not then forgotten or disregarded."

The wise, the intelligent, the provident, in the large towns of the north, must and will second you. When they behold a starving populace calling for bread, (and this, if such doctrines as those of the Journal of Commerce to which I have adverted are sanctioned, they must now in prospective, aud eventually *in fact* will behold,) they will offer their aid to stay the plague of such an excessive issue, and to employ at the same time, their surplus capital as well to insure the safety of their property in general, as to open to their distressed fellows, every channel whereby provisions can be brought to sustain their families, and enable their laborers and artizans, in their turn, to keep society in peace and good order, and to sustain the general interests and manufactures of the country. For, to suppose any progress in either art, science, or manufactures, where provisions are so high, as they are even now, is perfectly ridiculous—inferior wheat being 170 cents per bushel, and Commodore Ballard's 215 cents. In 1800 and thereabouts, if I am not much mistaken, the maximum of wheat, in the grazing county of Gloucester, Great Britain, was 160s. per quarter, i. e. 20s. or 480 cents per bushel; when, in Norfolk it was about half that price. Now, I think it is about 6s. or 140 cents in England. If circumstances of this kind are not calculated to arouse the torpid and awake those that are asleep, I know not what will.

I have referred to *Arator*. I could hope a new edition of this admirable work could be published, with notes correcting the then popular errors of its truly original author, and demonstrating the correctness of his views on agriculture and the monetary system. It would, I am convinced, go far to prove, that if capital is not by the mere force of public opinion and correction of popular error, applied to agriculture, that evil, infinite evil must be the consequence. What have not Sir J. Sinclair, Coke of Norfolk, Lord Somerville, and Francis Duke of Bedford—what have not these men done for the agriculture of Great Britain? And, perhaps, I might ask what would they, what could they have done, without the so much despised, so much abused corn laws? Laws, which have *now* rendered their country independent of others, and at all times able (for such I am convinced will in future be the case,) to supply her population with provisions. This leads me to ask if during some of the discussions in congress, perhaps, in consequence of Mr. Pinckney's urging the embargo as the means of distressing Great Britain, Mr. James Lloyd, then senator from Boston, did not demonstrate, that all the United States ever sent to Great Britain did not exceed a fortnight's consumption for her population? I speak from memory and may be wrong. Mr. Tracy's declaration on Mr. Madison's Resolutions, I believe, will not soon be forgotten. (*Vide* Marshall.)

G. L. C.

P. S. The remedy, I apprehend, will be found to be in the joint stock system, and a final termination to the chartered principle. Charters are the offspring of chicanery, and promoters of peculation. *Why, in defiance of tyranny, corruption, proscription, whether proceeding from the state or general government, will not the bank of the United States, with a capital so diffused as effectually to annihilate all two-penny chartered institutions, be created a general joint stock company!* The state of New York has a law restraining private banking. Where did it get the power to restrain trade in money, any more than it has to restrict a traffic in tin kettles? May this domestic despotism soon reach its period!

REMARKS ON THE WILLCOX GRAPE, AND OTHER SEEDLINGS.

To the Editor of the Farmers' Register.

Petersburg, Oct. 1*st*, 1836.

Observing in the last Register the request relative to native grape vines, I am induced to send you a piece of the vine of the *Willcox Grape*, with a bunch or two of the fruit attached thereto. It is a seedling—and the only vine known to be in existence, is now growing in the yard in front of the mansion house, at Walnut Hill, the country seat of Mr. J. V. Willcox, near this town. Mr. Willcox informed me, that the vine was found in the woods not far from the house, and he had it removed and planted where it is now growing. I tasted the fruit some years since, when the summer had been dry, and it was sweeter than the fruit now sent you. On sending to Walnut Hill to obtain a specimen of the fruit to day, what I send you was all that remained. Mr. W's. servant had preserved a quantity of them in sugar, and sent me, he being absent, a tumbler full, which were of very fine flavor. This variety deserves particular attention from its color, which is white, and from its sweetness—in other respects it very much resembles the wild summer grape, which ripens first in our woods. It is my opinion this variety would answer uncommonly well to put up in cotton, or sawdust, for winter use. I have made several unsuccessful attempts to propagate from this vine. Like many native varieties it is extremely difficult to raise from slips. I have had the slips sprout and grow till warm dry weather, and then die. I shall try ingrafting next year.

Among the varieties of American vines described by Prince in his Treatise on the Vine, I find no variety like this described, and among all the varieties not one in fifteen is white. The vine is said to have been heavily laden with fruit this year, and I think, for eating, it is preferable to Norton's Seedling.

I will add a few remarks as to my experience in cultivating a few of the native varieties of the vine. The soil of my vineyard, on the Appomattox near town, is what is called, in Prince George, the mulatto soil, and is much stiffer than I would wish it to be for a vineyard. The white Scuppernong succeeds well and never rots or mildews. The same may be said of the "Alexander," and in this respect it seems to me that deserves cultivation in preference to the Catawba or Isabella. The Alexander is a large black grape, and when fully ripe is an excellent fruit. I am trying the experiment of preserving them in cotton for winter use. The Catawbas and Isabellas have generally failed the present season in this part of the country, I presume on account of the extreme wet of the season. Some of the wild grapes in the woods rotted, apparently from the same cause. The Catawbas in my vineyard rotted equally as bad, if not worse than the Isabellas; and there were but few perfect bunches of the fruit of either kind on my vines. Those on the hill side, with a northern exposure, rotted worse than those on a level. A few years since, both of these kinds succeeded remarkably well in this part of the country. It seems to me, from rather a slight observation, that the same weather, which for three years past has blighted much of the wheat crop in this neighborhood, also produced the rot in the grapes. I have strong hopes, that when we are again blessed with a good wheat crop, the Catawbas and Isabellas will return into favor. But it is surely expedient to cut many of them down, and ingraft on the stocks those varieties which never fail to ripen well. The Bland does not generally ripen as well as the Catawbas, and Isabellas on frames. The best I have seen this year, and in fact ever saw grow, are vines which run on trees.

Norton's Seedling is a great bearer, and has not rotted at all this year in my vineyard. But I consider it inferior as a table fruit. In that respect it will bear no comparison with the Catawba, Isabella, Bland, or Alexander. I have them now all ripe together, and can well form a proper estimate of the flavor of each kind.

I have a few more varieties which I have not tested, but they will bear next year. A few vines in the vineyard of the white, red, and black fox-grape, common muscadine, black scuppernong, and Smart's Elsingburg, bear yearly, but they are in my estimation, hardly deserving the soil they occupy.

Feeling a deep interest in the extensive cultivation of the best varieties of native grapes, you will probably hear from me again.

A. B. SPOONER.

From the Genesee Farmer.

LIMING DESTROYS MALARIA.

It has been already shown in this journal, that one of the most important uses of lime is to absorb the gases which arise from fermentation, and which constitute the food for plants. Some of these vapors are mephitic; and it follows as a necessary consequence that their absorption by the lime must render the locality more salubrious—converting the poison into aliment, the nuisance into a blessing. We are not positive, though we are inclined to believe, that E. Ruffin was the first writer who brought the subject fairly before the public. It has also been mentioned however, in an English work, the "Journal of a Naturalist;" and M. Puvis speaks of it in decided terms.

The author of the excellent "Essay on Calcareous Manures," has proposed the introduction of *Marl* into towns and cities, to purify the streets, cellars, and back yards; and in our opinion no proposition of more importance has been made in modern times. There is reason to believe that had this measure been employed in 1832, thousands of our citizens might have been saved from the Asiatic Cholera. It is well known that a great disparity in cleanliness has existed between the different cities; and a corresponding disparity in the number of deaths at the time of that awful epidemic; yet in no case that we are aware of, have the streets been cleansed except by water or by scraping. These methods however are not entirely efficient. Filth will settle in between the paving stones, which neither method, under ordinary circumstances, can remove; but which *marl*, as if by magic, would render perfectly harmless. "The Conservators of the Public Health" possess great power, and ought to use it.

"The streets ought to be sprinkled with marl," says the last mentioned writer, "and as often as circumstances may require. The various putrescent matters usually left in the streets of a town alone, serve to make the mud scraped from them a valuable manure; yet the principal part of the bulk of street mud is composed merely of barren clay, brought in upon the wheels of wagons from the country. Such a cover of calcareous earth would be the most effectual absorbent and preserver of putrescent matter, as well as the cheapest mode of keeping a town always clean. There would be less noxious or offensive effluvia, than is generated in spite of all the ordinary means of prevention; and by scraping up and removing the marl after it had combined with and secured enough of putrescent matter, a compost would be obtained for the use of the surrounding country, so rich and so abundant that its use would repay a large part if not the whole of the expense incurred in its production. After twenty years of such a course, the surrounding farms might be capable of returning to the town a ten-fold increase surplus product."

Those who are habituated to breathe the pure air of the country, become very sensible of the noxious exhalations of the streets when they visit our cities, especially in the morning in hot clear weather before the wind rises, as it generally does, in the forenoon. But some localities are offensive at all seasons of the year. This is the case with slaughter houses; and it would be no unreasonable stretch of prerogative for our city and village authorities to insist on the abatement of such nuisances by a liberal application of *marl* or quick lime. The *former* is the best for the following reasons: "Quick lime forms new combinations with putrescent substances and in thus combining throws off effluvia, which though different from the products of putrescent matter alone, are still disagreeable and offensive. Mild lime on the contrary, absorbs and preserves every thing."*

It may now be proper to furnish some evidence of the salubrious influences of lime in the soil.

"My principal farm," says E. Ruffin, "until within some four or five years, was subject in *a remarkable degree* to the common mild autumnal diseases of our low country. Whether it is owing to marling, or other unknown causes, these *bilious diseases have since become comparatively rare.* Neither does my opinion in this respect, nor the facts that have occurred on my farm, stand alone. Some other persons are equally convinced of this change on other lands as well as on mine."

He afterwards says in 1835—"The foregoing was first published in the Farmer's Register for July, 1833. It is proper here to add, that the two autumns that have since passed, have brought no circumstances to weaken the opinions advanced, and many that have served on the contrary to strengthen them."

A correspondent of the Farmers' Register says, "The streets of Mobile are generally unpaved; and as a substitute for stone or gravel, which is not to be obtained, *shells* which have long been untenanted, are strewn over the carriage ways and side walks to the depth of several inches. These soon become a firm mass, and form a smooth surface, so as to resemble a M'Adamized road. The shells which are of various kinds and generally small, are raked up in great quantities in the shallow lakes, and brought to the city in large lighters. *Mobile is much more healthy now than it was before this plan of improving the streets was adopted.*"

Another correspondent of the same paper, subsequently says, "A few days ago I saw a near connection who has just returned from a settlement which he has made on the Black Warrior, about fifty miles below Tuscaloosa. He spoke of the fact that *Mobile had become much more healthy within a few years*, without however assigning any cause. He also represented a very large portion of that country between Tuscaloosa and Mobile, as *calcareous*, and abounding in ***shell marl*** or soft limestone. He says the country, if not more healthy, is certainly not more sickly than this, [the middle and hilly region of Virginia,] and that it appears to be *generally understood there that the marl preserves it from disease.*"

It appears from a letter dated at Mobile and published in the Farmers' Register, that until the year 1827 it was "counted unhealthy," not only because yellow fever had "raged like a pestilence" at different times, but also on account of bilious fevers. Various improvements however, were in progress, such as raising the streets above high tides, erecting brick buildings, &c. The writer says, in reference to these improvements, "Since 1827 the effect on the comfort and ***health*** of the place is abundantly obvious. Every street is *shelled*—all the alleys—many of the yards—all the public ware-house yards, and the tavern yards, are *shelled*—several of the streets are shelled for half a mile back, and one that meets a leading road is shelled over a mile—many of the cross streets are shelled, and ere long every street in the city will be shelled—it is indeed the settled policy. *Mobile has been uniformly healthy since* 1827. Last fall and this summer, while the Cholera raged so fatally in New Orleans, Mobile was visited with very few cases, and they excited little or no alarm. The deaths were four or five."

In another communication to the Editor of the Farmers' Register, it is said, "There is another fact connected with this part of the subject that strongly corroborates your views regarding the healthy action of calcareous earths on putrescent matter. The fact is that *the prairies have proved to be the healthiest part of the state*, notwithstanding the water is to all appearance bad, and is very unpleasant to the taste,"

A correspondent of the Southern Agriculturist, in referring to the prairies of Alabama, writes as follows: "I think the country more healthy than South Carolina, owing in part to its being more high, dry, and broken, and more under the influence of the strong trade winds; but *there must be a further reason*, because I have seen local causes enough to produce sickness here, in spite of the general causes of salubrity. Families reside with security on their prairie plantations all summer, in the midst of extensive clearings of rich land. *I think it must come from some purification of atmosphere arising from the immense quantity of lime on and near the surface of the soil.* The other lands in that country under similar circumstances, are not more healthy than in South Carolina."

We shall now present extracts from the "Essay on the use of Lime as a Manure." After referring to emanations which attack the health of the inhabitants," M. Puvis says, "This unhappy effect appears almost no where in calcareous regions: the margin of lakes and ponds there situated, do not produce the same unhealthiness, and even marshy grounds there are less unhealthy.

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* Essay on Calcareous Manures.

"Linnæus thought that the unhealthiness of most countries depended on the nature of the water, and was owing to the argillaceous particles which they contain. Now these *argillaceous particles are always precipitated by the calcareous compounds.* For this reason, the waters which stand upon, or run over marl or calcareous rock, are almost always *limpid and clear.*

"We are not far from believing then, that throwing *rich* marl or lime, into a well of muddy and brackish water, might have the effect, in part at least, of *clearing* it, and making it healthy to drink.

"Lime in all its combinations, destroys the miasmata dangerous to life. Its chloride annihilates all bad odors, arrests putrefaction, and in short, has subjected the plague of Egypt to the skill and courage of Paristo. The white-wash of lime upon infected buildings, upon the walls and mangers of stables, is regarded as serving to destroy the contagious miasmata of epidemic and epizootic diseases.

"The limed soil then, to the depth it is ploughed, ought to change its emanation as well as its products; and if the lower strata or subsoil send up emanations, these effluvia in passing through the improved layers of the soil, where the calcareous agent is always at work and developing all its affinities, ought also to be modified, and take the character of those of the upper bed. The limed soil then, it would seem, ought to be made healthy.

"But what we maintain here by induction, is fortunately a fact of extensive experience. *Among all the countries in which lime has carried and established fertility,* there is not cited that I know of, *a single one where intermittent fevers prevail*—while they have *never disappeared* in a country, even where an active culture draws good products from the impermeable argilo-silicious soil.

"To extend the great benefit of healthiness to the whole of a country, it is no doubt necessary that the whole country should receive this *health-giving agent.* On every farm, in proportion as liming is extended over its surface, the chance of disease will be seen to diminish; and *the healthiness of the country will keep pace with the progress of its fertility.*"—*Far. Reg. Vol.* 3.

TO GUARD HORSES FROM FLIES.

Farmers might easily save the flesh of horses and cows, and confer great kindness on their animals, in preventing the usual annoyance of flies, by simply washing the parts with the extract of pennyroyal. Flies will not alight a moment on the spot to which this has been applied. Every man who is compassionate to his beast, ought to know this simple remedy, and every livery stable and country inn, ought to have a supply on hand for travellers.—*Yankee Farmer.*

From the Southern Agriculturist.

INDIGO.

Indigo is made from the *riadigofera tinctoria.* The Spanish indigo is said to be the best in the world, but it is a fact, American, being produced in the province (now state) of Guatamala. Formerly it was made in this state for exportation, but gave place to cotton. The latter is so generally cultivated now, that attention may be very profitably directed again to indigo. When we abandoned the cultivation of it, some years past, there was comparatively a small demand for it, in this country and Europe. A vast proportion of the goods colored with that die, was imported from the East Indies; consequently the market for American indigo was extremely limited, and the planter gladly turned his attention to an article promising as good returns, and more ready sale. It was certain that cotton manufactories were rapidly progressing in Europe, and would consume all we could supply them. We had no glut to fear: consuming their fabricks, it was but natural they should give our raw material the preference. It is easy to overstock a market with dye-stuffs, but difficult to do so with the matter to be colored. This led to the abandonment of indigo, and now this country has to import large quantities for home consumption. We have now a home market for the article, with a daily increasing demand. The coarse goods we formerly imported from the East Indies we no longer see. We substitute European and American fabrics, which fabrics absorb vast quantities of coloring, and cause a consumption of indigo unknown in Europe and America, when that dye occupied the attention of our farmers. The supplies drawn in those days from North and South America, have dwindled down to almost nothing. The United States produce *none,* and the unsettled state of the countries formerly under the Spanish and Portuguese governments, must for many years to come, render supplies from that quarter both *partial* and *precarious.* It is evident, that while the demand for indigo on both sides the Atlantic is immensely greater than it was fifty years ago, the supplies from all countries upon the ocean north of Cape Horn, are diminished in the same ratio. As a home market is open for *large* quantities, I cannot but believe, many would find it to their advantage to substitute indigo for cotton. *Many* years must elapse, before we can produce more than a sufficiency for home consumption, and again become exporters. The supply of our own market is, I think, a sufficient inducement to cultivate the plant.

"The seed may be sown at all times, but spring is the best, and the species named in this communication makes the best indigo. It should be planted in good smooth soil, well tilled and not too dry, in furrows about six inches wide, two inches deep, and twelve apart. It must be kept clear of weeds. The plant ripens in about two months. When it begins to flower, cut it with pruning knives, and again every six weeks if the weather should be a little rainy. After two years, it degenerates and must be plucked up. The leaves and small branches should be gathered with great care, to avoid the shaking off the farina that lies on them, which is very valuable. Throw them into a large tub, or vat, with water, for fermentation, which will be completed in twenty-four hours at most. By means of a cock, or spigot, draw off the water into another tub or vat, called the mortar, or pounding tub. The steeping (or first tub) is cleared out, filled again, and so on. The salt of the plant must be separated by agitating the water in the mortar, by using wooden buckets full of holes, fixed to long handles. Be very careful in this part of the process. If the agitation be too soon stopped, the part used for dying, not being sufficiently separated from the salt, would be lost. If agitated too long after the salt is out, the parts remaining will form a new combination. The salt reacting on the dregs, will produce a second fermentation, change the color and make what is called burnt indigo. This will be prevented by close attention to the color, and changes of the dye, by drawing a little from time to time, into a clear vessel. When the coloring particles collect, by separating from the rest of the liquid, quit using the buckets, and let the dregs settle to the bottom. Holes in the tub, or vat, at different, but regular intervals of height, previously made and plugged, must now be opened, and the *clear* water drawn off. See that the water is clear before this is done, so as to secure every particle of dye-stuff. The dregs remaining are then to be drawn into the third tub, or vat, which is the settler. The water floating in this last vat, is to be withdrawn by means of a small perforation, minutely made above the dregs. When this is done, put the dregs into sacks, and when the drain of water ceases, put the indigo into chests or small boxes. At the end of three months it will be perfectly dry, and ready for sale any where."

"A hint to the wise is sufficient." Indigo requires no expensive machinery to prepare it for market. Every farmer can purchase a molasses cask, and make of it two tubs. Every one who knows the use of the saw and plane, can make a vat, perforate and spile it, and then make boxes or chests, for the indigo. The indigo planter will pay no toll of 6, 7, or 10 per cent, and his valuable commodity being less bulky, will pay less carriage than cotton, rice, or sugar.

From the Genesee Farmer.

NOTES OF OUR TRAVELS.

Having lately travelled through several counties of this district, we propose to detail some of the observations and reflections which we made on the journey.

In the valley of Salmon Creek in Cayuga county, we observe that the leaves of the Indian corn had become discolored and sere, in consequence of frost which happened some time in last month. In the more open country, however, subject to a free circulation of air, we saw no such effects; but on the morning of the 6th inst. another frost occurred, which we believe has not been equalled in severity so early in the season, since the year 1816. The Indian corn and buckwheat in many places, were nearly destroyed; and in most places more or less damaged. The potato tops also in low situations in the counties of Wayne and Seneca, were killed to be ground.

This calamity in connection with the light crops of wheat, will render it the duty of every farmer to save every thing that is suitable for human food, fattening his pork and beef on such articles as cannot be kept till next summer; and even then we apprehend that the *poor* on the rugged sterile hills and in many of our cities and villages, will be subject to great privations. Our canals, by furnishing the means of cheap transportation, will do much towards equalizing the prices of bread-stuffs; but if there are not provisions enough in the country to support the inhabitants, as many persons seriously believe, the calamity will be lessened but not entirely removed. We are not *alarmists*, but we think it well to look out ahead.

We have rarely had so good an opportunity to observe how very unequally the frost has operated in the same field. In some low grounds where the corn and buckwheat have been generally killed, small elevations in the surface of not more than a foot or two, *seem* to have preserved the plants in their full state of greenness; but on the contrary, in one potatoe field the higher part was damaged, and the lower part untouched. On inquiring into the particulars however, the same principle appears to have operated. The higher part of this field is mucky or spongy, while further down the slope the ground is dry and solid, showing that more depends on the *texture* of the soil, than on its relative *altitude*. The first case we have mentioned will not convince but rather confirm the opinion, though altitude doubtless, has an effect; and in some cornfields extending from the flats up the hillsides, the greenness which increased with the ascent, might properly be ascribed to both circumstances.

But how do these circumstances produce such phenomena? We presume it will not be difficult to explain. Frosts which occur near the close of spring, or the commencement of autumn, are chiefly owing to two causes; radiation and evaporation. In some of our earlier volumes, we have noticed that the heat in a metallic vessel filled with hot water, may be let off six times as fast, simply by painting its surface black. This result is entirely independent of the contact of cold substances; and the open ground may freeze when the temperature of the air only a few feet above it, is ten or twelve degrees warmer. At present we shall be brief on this subject. When the heat radiates to a *clear* sky, it is lost in the depths of ether; and when it is *calm*, the warmer air above is not whirled down on the surface. It is partly owing to these causes, that frost in moderate weather, can only occur under a *clear*, *calm* sky.

We may take a further view of this matter. Professor *Leslie* has shown that surfaces which most rapidly absorb heat, also radiate it most freely. The property of black soils in this respect is well known; and hence, we may expect them to be more subject to vernal and autumnal frosts than pale colored soils.

But the effects of evaporation must also be taken into the account. Some idea of its amount may be conceived by those who have watched the fog spreading over meadows in a calm evening. These exhalations rise so much more freely from black spongy soils, that the depressions of the land may be traced out by the fog that covers them; and it is along such winding swales that the corn and potatoes are most commonly damaged by the frost. It may be said indeed that fog keeps off the frost; but the atmosphere is not always in a state to condense the vapor which rises, though it is *then* invisible, and which requires for its production a large supply of heat. This heat is abstracted from the soil which cools rapidly in consequence.

At Waterloo we listened to a conversation on the course which a farmer ought to pursue when his corn has been struck by the frost so early in the season. Had the crop been more mature, all would have been in favor of cutting it up without delay, and setting it in small stooks; but its greenness in the present case, caused an objection. One old farmer said that corn would ripen when deprived of its tops by the knife, and why should it not ripen when deprived of its leaves by the frost? But not all the leaves were killed, and the juices were fresh in the stalk. He thought the best management was to let it alone.

We listened without speaking, but we have since been told by some who have examined ears of corn from time to time, that there is a prospect of its ripening much better than was expected. We allude to that which remains uncut.

Some farmers however, have tried the experiment of cutting up a part and leaving a part to stand; and we hope to be favored hereafter with the result.

On some farms, we observed that the old practice of topping corn still continues; but we believe it is entirely confined to the old fashioned farmers: *such as know too much to need an agricultural paper.* We are not ambitious to undertake the task of instructing them, but our readers may do well to remember that exact experiments have shown a great loss from that kind of mutilation. The leaves are a most important appendage to the plant. In these the *sap* is elaborated into *juice;* and fruits deprived of this benefit are generally, if not always, insipid or nauseous. Strip the vine of the leaves and the grape is worthless. Whether the *flavor* of corn is materially injured by this process, or not, we cannot say; but the loss in *quantity* admits of no dispute. Ch. Woodson, of Virginia, had the tops and blades taken from several rows of Indian corn, leaving the same number of rows untouched; and discovered when the grain was harvested that the corn of the unmutilated part, *weighed more than the corn and fodder put together* of the part which was topped and bladed. He says, "the whole labor of gathering and curing the fodder and tops (no inconsiderable item) was entirely lost."

As the subject is one of great interest, we *again* present to our readers a remark of the editor of the Farmers' Register which was appended to the communication: "If the absolute loss of labor in this usual and long prevailing practice of Virginia, is as great as we have supposed, and even half as great as may be inferred from the result of this experiment,—the amount of *the whole annual loss* and tax so paid, IF SAVED, *would be enough to defray the cost of constructing all the canals and railways now in progress in the state,* and *the expenses of the General Assembly to boot.*"

From the Genesee Farmer.

LOSS OF WEIGHT IN RIPE GRAIN, FROM DRYING.

In the Georgical Essays, it is stated that, from experiments carefully conducted, it was shown that wheat, gathered ripe, lost in 49 days nearly one-tenth of its weight; barley in 40 days lost one-seventh of its weight. This was in September. In October wheat lost in 24 days 2 lbs. 1 oz. in the bushel of 70 lbs. Grain stacked till April, sustained a loss of nearly 35 per cent. The Farmers' Magazine states, that Indian corn gathered dry and shelled in October, had lost in the May following, nearly 7 per cent. in measure. This was in England; in this country but few experiments of this kind have been conducted; and it is very desirable, in order that all interested in the selling and buying of grain may fully understand the ground they are going upon, that this subject of the shrinkage of grain should be properly investigated. Every farmer knows that grain shrinks rapidly, though the exact amount is rarely made the subject of calculation.

If the above estimates are correct, and we know no reason why they are not, farmers should calculate carefully the probable chances of a rise in the price of grain, before they conclude to keep theirs on hand for any length of time, or over the winter. That the loss, in shrinkage and wastage, in a lot of wheat kept from September until April or May, will fully equal 10 or 12 per cent. we fully believe. In other grains the loss would be still greater. Unless, therefore, a farmer has well founded expectations of quite an advance in the spring prices over those of the fall, it is clearly his interest to thrash and sell as soon as the fall prices are fairly established. The calculation of chances is, however, rather nice work for the farmer, and the best rule for him to adopt is, to dispose of whatever he has to sell, whenever an offer is made giving a decent profit on the cost of production.

From the Quarterly Journal of Agriculture, for June.

ON PRESERVING POTATOES AND RAISING THEM FROM SEED.

By Sir G. S. Mackenzie, Bart.

The Highland Society, always anxious to procure information, has offered a premium for the best and approved account, founded on experience, of the most successful method of preserving potatoes in good condition, in their natural state, for a period of not less than ten months from the time of their being taken up. I hope to be able to give to the Society satisfactory information on the above subject, having paid long and particular attention to the potatoe, and to state some circumstances which do not appear to be so generally known as I presumed they were until I saw the offer above quoted.

Of various methods I have tried for preserving potatoes from frost, that practised most commonly seems to be the best, viz: Making a shallow pit about a foot and a half deep, on a dry spot, and heaping the potatoes like a roof to the height of about four feet. On the heap thus formed, straw is laid to the thickness of about eight inches, and over this the earth taken out of the pit—the whole being beaten firm by the back of a spade. Some time about the end of February, or beginning of March, the pit is opened, and the potatoes turned over, all the shoots being picked off. I may here remark, that where a few side roots have proceeded from the shoots, I have planted them, and had almost as large a product as from sets. The mode of planting them is to cut a drill with a spade so deep that the shoots may be covered about two inches. They are laid inclined upwards towards the soil, covered, and another drill made, and so on. The only risk is from frost; for if once nipt down, their shoots do not recover so readily as those from sets. On this subject I beg to add, that for early potatoes it has long been my practice to spread sets on the floor of a vinery, or on a hot bed in March, with a little sand over them. By the time there is little risk of frost, the shoots are long enough for the sets to be planted out about the middle of April. I have frequently had the shoots nipt down, but they always recover; that is, new shoots spring up in a very short time, and I never observed that this made any difference in the period of the tubers becoming fit for use. The early potatoes I use are the London early for the first crop; some of my own, which is a little later, and remarkably mealy for an early potato. After the heap is turned over, as I stated above, it may be again covered, and the potatoes allowed to remain a month longer, after which they should be removed to a barn or shed, and picked. They should now be frequently turned over, and picked free of shoots. If the eyes of a potato are scooped out, it will gradually dry, if properly exposed; and it may then be scraped into flour, though not very white. In this state they will keep for an indefinite time: and there is no risk of their becoming mitey, as flour does. Dried potatoes might be found useful during long voyages, though potato flour is better.

It ought to be made generally known that there are varieties of the potato which, though sufficiently protected from frost, will not keep *under any management*, for more than a few months. Do what we will they decay, owing to their natural constitution; other varieties again will keep very long without any trouble. Hence the Society's proper object is not to offer a premium such as the one which has given occasion for the present communication, but to offer one for raising new varieties, and producing one or more with as many as possible of the qualities which a potato is desired to possess. The same observation applies to the keeping of apples and pears, and various fruits and roots. Long keeping is a particular property belonging only to some, and not to all varieties.

Some varieties of the potato are best for the table early in winter, and others are best in spring. Instead of having the trouble to raise different sorts, for different seasons, it is best to sow seeds, and to procure a number of varieties in this way for selection. It is now about twenty years since I first began to raise new varieties; and I will now state my mode of proceeding, that others may follow it if they think fit.

I first noted down the qualities which it was desirable a potato should have. These are, 1, dryness, or mealiness; 2, agreeable taste; 3, moderate size; 4, regularity of shape, not having deep eyes; 5, not bursting when boiled; 6, not having a tendency to shoot at an early period; 7, long keeping; 8, productiveness. Among hundreds of varieties I have not found one possessing *all* of these qualities, but I do not despair.

Having gathered the apples from different varieties, I keep them till spring, when I open them, take out the seeds and dry them. A piece of ground being prepared by digging in some manure, but sparingly, and the surface being finely raked, the seeds are dropped thinly into shallow drills, two feet asunder. When the plants appear, they are thinned out to eighteen inches in the rows, and I have usually selected the strongest. Those taken out may be transplanted to another spot. As the plants grow, the earth may be heaped round them. I have observed that, with some exceptions, those plants which flower the same season seldom produce tubers. My experience has proved that the produce of the first season is not to be relied on as an indication of future productiveness; therefore no seedling should be rejected the first year. I recollect a plant that produced but one tuber, about the size of a walnut; this produced the second year, one hundred and twenty tubers of good size; but this degree of productiveness did not attend succeeding generations. I have observed, in general, that rough or scaly skinned potatoes are the driest, and often too, the earliest. I plant every tuber produced the first year, that is not less than a pea—for should one hit on a good variety, it is then more rapidly increased: it is but a lottery, and some space of ground must be allotted to the drawing of it. I have had as many as three hundred varieties growing at once. Of course each variety must be tallied, and a memorandum kept of every thing connected with each. Each variety should be tested the second year, at the time it is taken up, and again in the spring, and those that are good at both seasons preferred for future trial. Indeed, all may be rejected but the one that has the greatest number of qualities noted. In this way every one may procure sooner or later a good variety of potato. It is of the greatest importance to procure in this way—for difference of soil, and even perhaps of situation, seems to have singular effects—a fine potato in one soil proving bad in another, and *vice versa*. I have one variety that possesses the 1st, 2d, 4th, 5th, 6th, and 7th qualities, which I have cultivated for about 18 years, and I have not yet succeeded in raising a better. It seldom, however, yields above twenty bolls an acre, of old Ross-shire measure, the peck being fifty-six pounds. Though there are many sorts more productive, yet this potato, keeping very long under the management already described, has brought it into very general use in this quarter. I have had young potatoes of this sort, of tolerable size at my table along with tubers of the previous year. It is ripe by the middle of September. During the two last seasons, the sets of potatoes decayed in many places. None of my own were affected, but some of my tenants lost large patches. I observed a wire worm on some of the decayed roots, but whether this worm was the cause of the failure, or the failure of the sets induced the insect, from whose egg the worm proceeded, to lay them on the set, I could not ascertain. It often happens that effects are regarded as causes in such matters. It is my practice to have the potatoes cut into sets, and spread out to dry during ten days, or a fortnight, before planting them. This serves to prevent the risk of their rotting in the ground. But I have known sets of some varieties rot soon after the appearance of the plant above ground; and others I have taken up sound when the crop was ripe. Thus it is clear that long keeping does not depend on the *mode* employed, to preserve potatoes, but on the natural quality of a variety; and the varieties ought to be increased from seeds until the qualities I have enumerated are found in one, or at least the most important of them. It is the opinion of some that the productiveness of potatoes decreases by long cultivation. I doubt: at least, it has not occurred to my observation. If a variety be planted on a soil different from that in which it has succeeded, it may fail, and I have known this to happen.

On the whole, I conceive that the object of the Society can be best attained by the recommendation to every one interested in the culture of potatoes, to raise new varities from seeds. Seedlings rejected, I mean the second year's produce, need not be thrown away, but given to cattle or pigs, so that the space occupied by the plants cannot be said to have been misapplied.

Since the above notices were written, extensive and accurate experiments have been made in the garden of the London Horticultural Society, in reference to the question, whether it is best to plant sets or whole potatoes. I had long since found that sets were best. The first experiment made, seemed, however, in favor of whole potatoes; but I pressed a repetition, and also repeated the experiments myself, and the question has now been finally decided in favor of sets. It might perhaps be of use that a well prepared abstract of the papers in the horticultural transactions should be drawn out for the *Quarterly Journal.* A great deal of nonsense has been published about the remarkable failures of the potato crop in different places. The thing is still a mystery, which may not be cleared up for some time. It appears that early planting gives heavier crops than late planting.

TO PREPARE ORCHARD GRASS SEED FOR SOWING.

The best seed is liable to fail, and this is the only difficulty, of any consequence experienced in the cultivation of this desirable and productive grass.

It is recommended to prepare the seed for sowing, so that it will come up, and grow as well as any other grass seed, to moisten the seed before sowing by spreading it, not very thin, on a floor, and with a watering pot sprinkle the seed pretty well, then mix all well together with a rake; if it does not appear damp enough next day, add more water, the seed being light it will absorb a good deal; and immediately before sowing, spread as much plaster of paris as will bring it to a good state.—*Yankee Far.*

EXPERIMENTS WITH MIXTURES OF ASHES, GYPSUM, LIME, &C. APPLIED TO CORN, WHEN PLANTED.

To the Editor of the Farmers' Register.

October 9th, 1836.

Should the following statement of experiments, made in planting this season's crop of corn, (though presenting negative results,) be thought of any importance to the readers of your valuable Register, it is at your service.

Experiment 1st.—2 bushels of leached ashes, and 1 bushel of gypsum.

Experiment 2d.—2 bushels of unleached ashes, and 1 bushel of gypsum.

Experiment 3d.—1¾ bushels of unleached ashes, 1 bushel of gypsum, and 1 gallon of salt.

Experiment 4th.—1¾ bushels of unleached ashes, 1 bushel of gypsum, and ¼ bushel of caustic lime.

The above four compounds were separately applied on a marked length of five rows, at the rate of a full handful to each hill of corn, previous to covering, with six rows intervening between each experiment without any application—the soil of the whole being of good quality, and presenting a favorable opportunity for judging of the results.

Experiment 5th.—17½ bushels of leached ashes, 5¾ bushels of gypsum, and two bushels of caustic lime: this mixture was also applied at the rate of a full handful to each hill of corn, with intervening rows without any application.

Experiment 6th.—16 Bushels of unleached ashes, 5⅓ bushels of gypsum, and 2 bushels of caustic lime, applied in the same proportion to each hill, as in the preceeding experiments, and also with intervening rows without any application.

Experiment 7th.—20 bushels of gypsum, 2 bushels of caustic lime, and 2 pounds of sulphur: this mixture was applied in various proportions, from a handful to 2 hills of corn, to the same quantity on 4. Connected with and forming a part of this experiment, were 5 bushels of gypsum deprived of its water by heating, and applied at the rate of a handful to two hills of corn. A few days ago when cutting down this corn, I found that the gypsum, though artificially deprived of its constituent proportion of water, had on coming in contact with the water in the soil, re-absorbed it, and formed into a hard cake, very slightly mixed with particles of the soil: from this I infer that gypsum thus prepared, cannot properly or beneficially be applied in such quantities as in the above experiment. None of the gypsum used in this experiment without being deprived of its water, though applied in the same quantities to each hill, can now be seen.

These experiments cover a space of ground altogether, of nearly 40 acres, on soils presenting considerable difference, and so arranged as plainly to exhibit any benefit which might have been derived from them, and every care was used in the due application of the different mixtures, and not without hope of considerable benefit: in this, however, I am disappointed, as not the slightest apparent benefit has been derived from any of these experiments.

Similar experiments made with ashes and gypsum by others, as reported in the Register, and other agricultural periodicals, present highly beneficial results, not only in the increased growth of the corn, but in protecting it from the ravages of insects and crows. In this latter supposed benefit, I derived as little apparent good as in the growth of corn. What causes may have operated to produce this difference in results, in experiments so nearly alike, cannot probably be accurately known. All of the soil on which the above experiments were made, had been rendered calcareous by the free use of marl, which may so far account for the want of benefit from the application of the ashes and lime. That no benefit was derived from this liberal use of gypsum, I attribute to the soil already containing a sufficient proportion of that combination of lime for fertilizing purposes. In this belief, I am strengthened by having applied it to clover sown amongst the corn in the same field, and adjoining these experiments: a part of the clover was left unplastered, and exhibits no inferiority to that which had gypsum applied at the rate of 1 bushel per acre.

The expense attending these experiments was considerable in point of labor—at least doubling the expenses of corn planting—and in this case, without any remunerating results: notwithstanding which, I am still of opinion, that on soils not calcareous either naturally or artificially, this mode of applying ashes would be attended with highly beneficial results, as experience has proved that sulphate of lime is inert on soils that are not calcareous.

N. L.

For the Farmers' Register.

FRAGMENTS OF MY MEMORANDOM BOOK.

[Continued from No. 5.]

January 6th, 1833. At two farms of Mr. G——, on Chickahomony Swamp, and his residence on the Brook, within Henrico, and about 6 miles from Richmond. On Mr. G.'s land, and in that neighborhood generally (from 1 to 3 miles of the granite ridge) there is found an abundance of fossil shells, and their remains, in a form and appearance differing from all that I have seen. In most of the ravines may be seen a wet blueish clay, which contains no shells, and no calcareous matter—but is full of the hollow forms or moulds of shells which have disappeared. In this respect, this clay is like the gypseous earth which I have found (and elsewhere described) in Prince George—and from Mr. G.'s description of this, presented to me though the *Enquirer*, I at first thought it to be also gypseous earth. But if it is so, it must have lost all or nearly all the gypsum into which the shells were changed, as is the case generally in our gypseous earth on James River—and this loss seems inevitable in the Henrico earth, as it is always found wet. This earth after being dug, and exposed a day or so to the air, gives out a strong and offensive sulphureous odor—which is not the case with our gypseous earth, but is (in some degree) with the marl of Dr. W. Cocke, on Blackwater, in Sussex. Wherever Mr. G. has dug through this earth he finds that it changes to *marl*, or in other words, the *shells* are found instead of their empty places. The first shells found where the change takes place, are more or less colored brown, like rusty iron. Judging by my eyes only, I should think this marl poor in calcareous matter, the only ingredient that I have much experience of, or have found of much value: but it may be that the sulphur, or sulphuret of iron which is also here present, may increase the value of the manure. None has yet been used for manure, nor has a sufficient depth been dug, to furnish fair samples of the body. No attention was paid to the existence of marl in this part of the country until very lately: but though none has been tried, it has already served to raise the price of land.

Chickahomony Swamp here first came under my observation. Its growth of timber shows that it never has been exposed so much to inundation as Blackwater: though both these, and many other swamps in Lower Vrginia agree in the general characters of being remarkably flat, and subject to frequent and long inundation, for want of sufficient passage way for the water. They also agree in the ease and cheapness with which they might be drained by opening the main passage throughout—the vast quantity of valuable land that might be thus reclaimed—and also in the strange neglect of those interested, of this great profit which might be thus obtained at a small expense. This neglect is the more remarkable here, because a canal 24 feet wide has already been carried through the swamp at this place, but which was not continued to the open navigable water of Chickahomony. This operation has furnished a practical proof of the importance of continuing the work, not only for profit, but to prevent increased evils to the lower proprietors. The water from the heavy rains, being now unobstructed, passes down the canal so rapidly as to inundate the swamp lands below, where the obstructions remain, much more than formerly. Yet even this does not cause the canal to be continued. Where I saw the canal, the water passed with a velocity that would not have been supposed by those who have only seen such swamps, before any obstructions have been removed. The depth is sufficient for navigation in flat boats, though no use is made of it for that purpose. In dry seasons in summer, it is a mere rivulet. I have often urged the general draining of Blackwater Swamp, by a continued central drain—and have thought that 10 feet width and 4 feet depth might suffice for that purpose, and that the expense would not exceed 50 or 70 cents the running yard. Here 24 feet is the width, and is not too much: but the cost was far below my estimate, having been contracted for at only 25 cents. The cause of this remarkably cheap price was that the canal was carried generally along the former crooked course of the main body of water, which being often deep and wide enough for considerable distances together, lessened the labor of digging—though by this plan the course is longer and more crooked, and the draining less perfect than if a new and more judicious line had been adopted. So in Blackwater Swamp, the water in the main passage is sometimes for hundreds of yards together, deep enough for keel vessels, and then is obstructed and scattered by a *raft* of fallen trees, and the rubbish they have stopped. The reclaiming of these swamps would be as profitable, as it is otherwise on the tide marshes. Yet the first has no where been effected (on a general or proper plan) and the latter is continually attempted, in spite of all previous failures. The cause of the difference is, that it reqnires the combined efforts of numerous landholders to drain an extensive swamp, and a single stupid or obstinate proprietor may stop the whole work—and our still more stupid laws, (which might be supposed to be made by the enemies of agriculture,) afford no redress. The land of a single minor, or life owner, lying in the route of the proposed canal, is sufficient to prevent its being carried into effect. And this sacrifice of value, and other like consequences, are owing to the scrupulous care (so called) which our law takes of the rights of property, and especially of the property of widows and orphans!

The timber of Chickahomony Swamp at this place is generally of ash and gum, but is partly of large willow-oak, which is of considerable value. The soil is sometimes sandy, and sometimes a cold stiff clay, neither of which is very rich for swamp land. But the *mud soil*, which forms the remaining class is remarkably fertile. None of the main body of swamp land on the canal is fit for grain crops. On the outskirts and higher parts not exposed to inundation, corn is cultivated to much advantage. Mr. G. showed me a body of about 70 acres of a remarkably black rich though silicious soil, full of vegetable matter, which differed in appearance, and greatly surpassed in value, all the adjoining swamp land. This rich tract lies at the outlet of two streams, which must formerly have overflowed it: and into these two streams run all the smaller streams and ravines in which marl has been found.

Mr. G. has found gypsum to have beneficial effects on clover on his highland surpassing any I have experienced or heard of on soils of similar appearance: and indeed he has succeeded in raising clover without gypsum on land, that from its appearance I should not think capable of keeping it alive. The time of year, and the previous grazing forbade much *show* being made by the clover: but its being alive, and well set, proved to me that the soil of this neighborhood must have been originally much better than it now appears. The soil is a gravelly gray loam, on a red clay subsoil. Its product Mr. G. has found to be always increased by very deep ploughing, which he gradually arrives at, by deepening the furrow an inch at each cultivation. He has been but a few years in possession.

The land of this neighborhood is high, and much of it hilly. Mr. G. uses to much advantage, a very simple *hillside* plough, made of cast iron in part. It is easily and quickly changed, at the end of each furrow, so as to throw the slice first to the right and then to the left, and always down hill. I have seen plates and descriptions of such ploughs 10 years ago—but it required the sight of the plough itself to prove to me the property of buying and using it—which I shall now certainly do.

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My friend J—— W—— of Goochland, whom I met with in Richmond, told me of the following experiment made by him on summer cowpens. Through the summer, the moveable pens for his cattle were made of equal size, and stood equal times, but varied as follows:

Pen, No. 1. Not ploughed before or after being used for the cattle.

Do. No. 2. Ploughed before using.

Do. No. 3. Ploughed after removing the cattle, and not before.

The next pens, the 4th 5th and 6th, were treated in the same manner and order, and also the succeeding pens, until all were together ploughed for wheat the same autumn. The comparative effects on the wheat were as follows: The tallest and best wheat was on No. 2, and the pens similarly treated—next on No. 1—and the worst considerably, on No. 3.

Another comparison was afterwards made between the plans pursued on No. 2, and No. 3, and it was seen that a pen standing 5 days on the former, produced as good wheat apparently, as ten days on the latter.

W—— informs me that a new practice of applying manure is extending in his neighborhood, and is sanctioned by the approbation and experience of R—— S——, one of the best practical farmers in Virginia. It is to apply all their farmyard and stable manure (in a more or less rotted state) as a thin top dressing to wheat, during the winter. More benefit is supposed to be obtained for grain: and another certain benefit is found in the remarkable improvement to the clover sown about the same time. This practice requires farther inquiry, as it is a very important improvement, if these opinions are well founded. Mr. S—— Col. W—— and others on James River in Goochland make no corn on their highland, which is kept altogether for small grain and clover (as stated in my former memoranda of a visit to those gentlemen) and cultivate in corn only their rich river lowgrounds. This peculiar husbandry may in some degree require their top dressing on wheat.

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April 18th 1834. At B——, Prince George. One of the peculiarities of this extensive and valuable body of land is presented by the numerous basin-shaped depressions, which were ponds before being drained. As they were supplied only by rain water from the adjacent higher lands, and have no springs, their draining was a very simple and easy job. A central ditch leading to some lower land is all that was needed: and such a ditch may be ploughed to the edges, and by turning the furrows outward, leave but little cleaning is to be done by spades and shovels.

Mr. H—— stated that all these former ponds were very rich except their outer part: and this always was a belt of poor soil, from the first draining, greatly inferior to the black loam which formed the central part of the pond, and as much so to the fine brown loam, which forms the general body of the higher grounds. These poor belts must have been continually changing between wet and dry, or naked in dry seasons, and overflowed in wet, when in a state of nature—and the sterility must have been caused by the rapid decomposition of the vegetable matters so exposed.

Mr. H. has a cast iron corn-crusher, which, is fixed in a very simple manner. The lever to which the horses are fixed, (as in a thrashing machine) proceeds directly from the upright shaft or spindle of the crusher—no cog wheel or any other contrivance to give increased velocity. Of course, the crusher can only turn once while the horses walk once around their circle. It crushes, fine enough for food, 40 bushels of ears of corn a day (cob and grain together,) and will grind as much gypsum, after it has been broken to lumps not larger than a man's fist. Examined the ground gypsum. It had been sifted, and the greater part was as fine as meal. The coarser part, did not exceed grains of cockle in size. The machine cost $60, exclusive of the shed and simple horse power, and was worked by two horses.

19th, Charles City county. Mr. M——'s first vessel load of marl, from Coggin's Point, in heaps on his land, presenting a novel spectacle in this part of the country. In riding by, fell in with two of his neighbors to whom I was unknown, and inquired of them concerning Mr. M——'s scheme of obtaining marl by water carriage—and contrary to my expectation, found that he was *not* considered a fool for his pains. His work was highly applauded, and the manure was spoken of as even more valuable than it is in truth. The few loads of marl that have been before carried by water were obtained under all the disadvantages of a new business, not intended to continue—and of course attended with more than double cost. Mr. M. has gone to work like a man of business, as well as of enterprise—and though he also has his apprenticeship to pay for, I am confident that he will show the expense of water-borne marl to be less than half the previous usual estimate, and his operations will extend its use beyond what any one supposed possible a few years ago. No means yet are furnished for making correct estimates: but I count on the total expense of landing marl 8 to 20 miles from the place at which it is dug, and embarked, being within 2 cents the heaped bushel—including every part of the labor. When this is proved to be true, the use will be extended to every farm on tide water, that has not marl beneath its own surface.

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From the Genesee Farmer.

WHITE RATS.

A year or two since a friend of ours had some pumpkins late in the fall, lying in his barn, and once or twice he observed among them some white animal, which he at first supposed to be a white weasel; but on obtaining a fairer view, saw it was a rat. Driven to its retreat it was found that a pair of them had taken possession of one of the largest pumpkins, in which they had commenced a nest, preparatory to a winter's abode. They were both killed. There was not we believe a dark hair upon them, and though not a pure white, having a slight yellowish tinge, their appearance was on the whole singular. They were evidently *Albinoes*, having the pink eyes so peculiar to that race, whether belonging to man or to the animal. A week or two since we caught in a trap another, possessing the same peculiarities of color, and the Albino conformation. Several years since we shot a squirrel, resembling in size and in every respect one of the common black or gray squirrels, except that he was of a pure and beautiful white, and had the pink eyes so characteristic of the Albino. He was one of the finest looking animals we have ever seen, and there was a feeling of regret, that in order to secure him for a closer inspection it was necessary to kill him. There was not a hair of any other color than pure white upon him, and his large bushy tail, as he frolicked on the ground or playfully leaped about on the trees, gave him a most elegant appearance. Albinoes exist among all races of men; even among the negroes of Africa, Park found one of chalky whiteness; and wherever they exist, the striking peculiarity attending their eyes, serves to render them more observable, and entirely distinct from any other of the same race.

G.

From the Farmers' Series of the Library of Useful Knowledge.

MEADOW.

It has been remarked by the writers on agriculture, that *natural meadows* are no where to be found; because all grass land which is in a state of nature, neither enclosed nor cultivated, is universally pasture. Many centuries probably elapsed before the invention of preserving grass by drying it into a state of hay; and this discovery, which gave rise to what we now term meadow, is supposed to have preceded that of tillage; though this may be considered somewhat doubtful, when we reflect that, in the primitive state of husbandry in this country, the cattle which were intended for consumption during the winter, were slaughtered in the latter end of autumn, and salted for use. To such tracts of ground as consist of maiden earth, some persons are still disposed to limit the extent of meadow land; but, generally speaking, all land that is annually, or even occasionally, mown, is at present known under the denomination. Some considerable tracts of marsh have never yet been submitted to the plough, and much land, which, lying on the banks of rivers, is subject to be occasionally overflowed, is still in a virgin state; but by far the greater part of the upland meadow throughout the kingdom bears evident marks of having been anciently under cultivation.

The general *management of meadow land* lies in a narrow compass—little diversified by practice, except when rendered necessary by difference of season and quality of soil. As the early vegetation of grass is promoted by taking the stock soon off the ground, the uplands are usually "hayned," or laid up at Candlemas; but richer land is often left open until the latter end of March; sometimes, indeed, particularly if the weather be moist, even later:* but, if continued too long, the hay-harvest is proportionably retarded and diminished. On this subject Mr. Sinclair has stated that a given space of the same quality of grass having been cut towards the end of March, and another space of equal size left uncut until the last week in April, the produce of each being afterwards taken at three different cuttings, that of the space last cut exceeded the former in the proportion of three or two; and in one instance during a dry summer, the last cropped space exceeded that which was cropped [first] nearly as two to one.† On land of the latter description, care should also be taken to remove the heavy cattle early in autumn; for such ground being commonly of a loamy nature, and soon softened by a fall of rain, would otherwise be poached, and it is well known that in wet weather the hooves of bullocks form holes which hold water, and thus render the herbage sour.

After the hay has been removed, the meadows are generally shut up for some weeks, until the grass again springs, when the stock are turned upon them in such proportion as they appear able to bear during the autumn; though light store stock are sometimes turned in immediately to crop such spots around the margins, and in the water furrows, as may have escaped the scythe. Other farmers, however, reserve it during winter, and then use it in the manner already stated in the preceding account of fogging. Some, also, who live in the neighborhood of large towns, where they have the advantage of procuring manure, mow the land a second time some time in the month of August; but in that case they should be earlier than usual in the cutting of the first crop. Cowkeepers, indeed, frequently cut it two or three times in the summer, as they find that rowen hay is of a soft grassy quality, which occasions a greater flush of milk than that which is first mown, though it does not increase its richness, and they, therefore, cut the grass long before the seed has time to ripen. This frequent mowing, however, if it does not exhaust the soil, has a tendency to reduce the herbage:* an injury to which new meadows are more exposed than such as are old; and therefore, land recently laid down to grass, should not be mown, but pastured with sheep, or with very light stock, during the two first years, as the surer method of furnishing it with luxuriant herbage.

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* Land of this description has been spring-fed till the 12th of May, and has afterwards—when mown on 24th of June—yielded two tons of hay per acre. Somerset Rep., 3d edition, p. 179.

† Hort. Gram. Woburn.; 3d edit. p. 389.

After the cattle are removed, the land is *bush-harrowed and rolled.* The bush-harrowing spreads those small portions of mould which are thrown upon the surface by the earth-worms, and are, so far, an excellent dressing, when the operation is properly performed. This, however, is most commonly done by interweaving some strong, but pliant, branches of trees, hedge-row thorns, through the open squares of a heavy harrow, which thus forms an efficient brush, and when drawn over the ground performs its duty perfectly during a short distance; but the branches, being pressed close, and worn by the motion, soon become so flat as not to have the effect of spreading the earth. The better mode is, therefore, to fix the branches upright in a frame placed in the front part of the carriage of the roller; by which means they can be so placed as to sweep the ground effectually, and when worn can be moved a little lower down, so as to continue the work with regularity. In this manner the bush-harrow can also be drawn by a single horse and driven by one man, instead of employing two horses and two drivers, as is the case when the land is rolled and harrowed separately. The object of rolling is merely to lay the land as smooth as possible for the convenience of the mowers, for it is thought by many farmers to retard the progress of vegetation; though there can be little doubt, that if the soil is porous and spongy, the roll will add to its firmness, and give a more substantial bottom to the sward. It has, indeed, been stated, that the operation of heavy rolling has been found to add six or seven hundred weight of hay per acre to the produce of the crop.†

It is also generally thought proper to *destroy the moles* which sometimes burrow in meadow ground, for they raise hills which impede the operation of the scythe, and we shall, therefore, furnish directions for that purpose, under the head of virmin: but it has been lately much doubted whether the mischief which those animals do to pasture land, is not more than counterbalanced—particularly on sheep pasture—by the benefit derived from the top-dressing thus thrown up.

Land that is constantly mown must also be frequently manured, or it will be thrown out of heart. This, however, is very imperfectly attended to by most of those farmers whose holdings consist chiefly of arable land; but grass farmers are well aware that if they do not lay a good coating of rotten dung upon the ground once within three or four years, they will have but a slender crop of hay, even if the after-grass be all pastured. It is, indeed, supposed that a perfectly thick bottom cannot be maintained upon such land, unless it is manured every second year, and therefore many of the farmers in Middlesex covenant to mow only once in each year, and to spread on the land a full coat of stable dung, thoroughly rotten, every third year, and this management has been found to support the soil in good heart.* If the weather proves moist, or inclinable to rain, it is usually laid on immediately after the removal of the hay; but if the season is dry, the operation is then deferred until some time in the autumn, or, more frequently, until early in the spring.

From the Silkworm.

PROFITS OF MULBERRY CULTURE.

A hypothetical calculation appears in the Northampton Courier, of August 3, intended, no doubt, to encourage adventurers in the cultivation of silk, but which, probably, a great majority of those into whose hands it may fall, will pronounce one of those European calculations, which figure on paper but vanish in practice. It is true that many people have been disappointed and some ruined by trusting to calculations on paper, without practice; but should this happen in the present case, it must be owing to bad management or to some misfortune. Facts are certainly stubborn things; and there is not an item in the above calculation but what has been outdone in practice.

The writer proposes to have a poor man hire an acre of sandy soil, suitable for the mulberry; this any honest poor man may easily do: the rent he estimates at $6—this is certainly enough. He is to procure 100 cuttings of the Chinese mulberry at $6 also; this is one dollar above the common price. He calculates that, besides the little corner of his acre which his cuttings will occupy, the remainder will be worth enough to pay the little attendance and that his 100 trees the next season will be worth $25; the lowest current price is now $30 and in great demand.

For the business of the second year he reckons 1000 trees from cuttings at $25 per hundred, and the same number from layers at the same price, and his hundred last year's trees also at $25. The only mistakes in this are, that he should have set his young trees at $30 and those of last year at $40.

At the close of the third year he hypothecates 2100 trees of two years old still at $25 per hundred, and 41000 cuttings and layers—trees—at $25. The first should be $50, and the two others $30: So that he has in these three items for the third year, underrated the truth $2155.

To prove the facts, the following article, from Mr. Ward Cheney, of Manchester, Ct. showing

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* In the Berkshire Report it is, however, said that—"the grass being cut when very young, the land is less exhausted, though frequently cut thrice, than with us, where it remains on the ground before mowing, till a considerable number of the plants have ripened their seeds."—p. 296.

† Derbyshire Report, vol. ii. p. 188.

* Survey of Middlesex, 2nd edition, p. 287.

—not what he can do, but what he has done, and can do again, one might suppose would remove all doubts from the subject.

"To the Editor of the Northampton Courier:

Manchester, Ct. August 8, 1836.

"In reference to an article in your valuable paper of August 3d, in which you inserted a statement of the profit of the culture of the Chinese mulberry, from a small beginning, under the head of "Who would not be a Silk Grower."

To prove that the writer is by no means extravagant in his calculations, I will prove the *actual experiment* I have made this season in Manchester, Connecticut.

On the 12th of May, I set out several thousands of the Morus Multicaulis, of which, I took for experiment 300 trees and set them on ten rods of ground, or one-sixteenth of an acre. Instead of setting the trees perpendicular, they were placed horizontally in the ground, forming a continued row of trees in the following manner: having ploughed a furrow five or six inches deep, I laid the roots and a single stalk in the furrow, so that the end of the stalk should be covered about two inches deep. The rows were three feet apart. From these 300 trees and roots so planted, I now have 3700 fine trees or shoots, which on the 1st day of August would average 2½ feet in height, with large substantial roots of the size of common goose quills.

On the 15th of June I commenced feeding six thousand worms of the six weeks kind, on the foliage of these 3700 shoots, and on the first day of August, the 6000 worms were transformed into three bushels of the finest cocoons I ever saw, (each of which bushels I presume would reel at least 1½lbs. of silk) worth at least $15. By the 15th of September from the same trees I shall have sufficient foliage to feed 10,000 worms, which would yield three to four bushels more. For the above three hundred trees, I paid 37½ cents each last spring, and estimate their product, 3700, will be worth at least 25 cents each, or $925, and the three bushels of cocoons worth $15, making

	$940 00
Deducting the cost of the three hundred trees, last spring,	112 00
Ditto labor and expense of feeding the worms, and land,	12 00
Leaving a profit on the two hundred trees, for the first year, of	$815 30

Now, if this should be carried out through the second and third year, as was done in the case referred to, I think the result would exceed that of the *silk cabinet*.

From the experience of the last and the present year, I consider that good cuttings on good land will produce at least half a pound of foliage each.

The writer in your last has made allowance for cultivation, feeding of worms, gathering of foliage and other items of deduction, which I do not think is necessary, and instead of the result given for the second and third year being excessive, I must say, that in my opinion, from the experience I have had, and experiments made, the profits might have been greater than there made. I presume the object of the writer was merely to convince the public that the culture of the mulberry and silk might be made a lucrative employment, sufficiently so, to encourage the culture of silk to almost any extent.

I consider it less labor to gather five pounds of foliage from the Chinese or Morus Multicaulis, than to gather one pound from the white mulberry. I have been engaged three years in the culture of the mulberry and manufacture of silk, constantly making experiments, and am fully satisfied that the business may be a profitable one to be pursued in families, as well as by corporations. It is my intention to erect a large cocoonery next fall or spring, upon a new and improved plan of my own invention, about which you may know more hereafter.

At my establishment, about 100,000 of the Chinese, or Multicaulis, are under successful cultivation, and I am so well satisfied with the results of experiments already made, that a similar course will be pursued next year, as the most sure method for propagating the trees, and increasing the quantity of the foliage. I am daily removing the leaves and topping the sprouts, to check the growth of the tree and hasten the product of wood. Some of the sprouts have been cropped of their leaves three or four times without any injury, and every succeeding crop of leaves is improved; although the size may be less, the number and weight have been increased.

From my own experience I am fully convinced, with Mr. Whitmarsh and Dr. Stebbins of Northampton, that the Chinese mulberry ought to be headed down every year, in order to multiply the tree and foliage, and that in this way the tree may be preserved during winter, slightly covering the stumps in the field, and the tops to be used as cuttings the next year. In a large field the stumps may have a light furrow turned over them with a horse plough. The roots left in the ground will be considered as permanent roots. Although it may be necessary or prudent for the plants from seeds, cuttings or layer trees, formed by bending down the side branches, to be removed to the cellar during winter, yet I do not consider that trees cultivated by burying the root and stalk early in the spring will need removal, on account of the early formation of roots, and presume they will make good standards.

WARD CHENEY."

From the Cultivator.

WILSON'S MOWING AND GRAIN CUTTING MACHINE.

Among the thousands of labor saving inventions, which form one of the most prominent features of the present age, it is natural to expect that many splendid and plausible plans may prove abortive, and deceive the inventors, and often the public; and therefore, few men, if any, are capable of deciding with certainty on the merits of an invention, until experience shall sanction the decision.

A machine has been recently exhibited in this city and its vicinity, by the inventor, Capt. Alexander M. Wilson, of Rhinebeck, for mowing grass and cutting grain. I will predicate my remarks on what I saw, and leave time and experience to decide on its merits.

The machine consists of a carriage on two wheels, propelled by one or two horses, oxen or other beasts of burden, travelling in the rear and pushing it forward. In the front, at the bottom, is a horizontal wheel upon an upright shaft, which shaft and wheel receive a rotary motion, communicated by gear from the main axle, which revolves with its wheels, as the machine goes forward. The diameter of this horizontal wheel, with the addition of the knives projecting from its edge, measures the width of the swath, which is cut with the knives as the wheel goes forward, revolving rapidly and lying close to the ground. The apparatus which sustains the cutting is so constructed as to accommodate its height to any inequalities in the ground, and to give it any inclination required. The knives are sharpened by their own operation, without stopping the machine. There is also attached to the upper side of the cutting wheel a rim which gathers the grass as it is cut, and lays it in a swath more regularly than it can be laid by the scythe.

I saw it in operation, propelled by two horses, and cutting a swath about six feet wide, as fast as the horse could walk; and though the ground was very uneven, and the grass somewhat dry and in bad order, it performed the work as well as it could be done by hand.

I know not what objections experience may raise against it, but I would venture to say, if this most tedious and yet most important labor of the husbandman, is ever to be successfully performed by machinery, I think this machine more likely to effect it than any other plan I have seen. It would be absurd to expect this or any other mowing machine, to operate on new and rough land, among stones and stumps—but our country affords numerous large tracts of meadow with fine smooth bottom, and the proportion is rapidly increasing; and in the great western prairies, such a machine cannot fail to be one of the most useful improvements of the age. I would therefore advise every agriculturist who has smooth meadows, or which can be made smooth, particularly those at the far west, to see this machine, and endeavor to promote its introduction, so far at least as to give it a fair trial.

S. BLYDENBURGH.

Reference made to the patentee, Rhinebeck, Dutchess Co., or to George Hanford, No. 409 South Market-street, Albany.

Extract from the Cultivator.

THE CUT WORM.

The cut worms are evidently the numerous progeny of some familiar insect. The question arises, to what species can they be attributed? Some are led to conjecture, that these are propagated by the order *Coleoptera*, or beetle: although I have examined, with some care, the several species of the beetle tribe common in this country, among which the pellet beetle is most numerous, yet I have invariably found their larvæ of pale yellowish, or light brown color; whereas the cut worm is nearly black, and very different in its habits. The conjecture that the cut worms are the larvæ of the beetle, or any other perpetual insect, should be humbled by the single circumstance, that the cut worm is periodical in its devastating visitations, and consequently can be the progeny *only* of a periodical insect. I know none of that character bearing a semblance of suspicion, excepting the *cicada septemdecem*, of the order *hemiptera*, genus *cicada*, and species *grilli* or *grillus* of Linn. (here very improperly mis-termed locust, for those visiting Europe and Africa, whose history present a series of calamities, inspiring all people with superstitious horror.) The American cicada is remarkable for its regular and simultaneous reappearance every seventeen years, in countless millions. They appeared here in 1817 and 1834, several years succeeding each of those dates, have been marked, by the destruction of the cut worm. And as some of the cicada appear every year, we also find *some* however *few*, of the cut worm every year. It is ascertained, that the cicada deposite each from 600 to 1,000 eggs, forming of course a numerous progeny.

This conjecture of mine, relative to the cut worm, although strengthened by observation and experience, yet should any of your observing and enlightened correspondence offer an idea more plausible, the above shall be freely yielded notwithstanding.

Many practical farmers have prescribed remedies to counteract the ravages of the cut worm, stating the consummate success of their *modus operandi;* but it is matter of reget to know, that an effectual remedy is still wanting, to expel or dislodge them when once in possession of the corn hill. There are, however, preventives, well worthy the farmer's attention. The most effectual prevention consists in ploughing sward ground intended for corn in autumn, previous to planting; but if this be not convenient, a stubble field should be chosen, if ploughed in the spring; the rationale or philosophy of the mode is simply this, the sod being turned up to the frost of winter, it becomes so meliorated and consolidated by spring, (if well ploughed) that there will be no green thing scarcely of vegetable kind left for the larvæ of the insect to subsist upon, and consequently they either desert the field or perish. The same parity of reasoning holds good for stubble ground, it being also destitute of food, and thus affording the grub no harbor. Another method, by means of which I have entirely succeeded the present season, notwithstanding the adjacent field of a neighbor was wholly destroyed, it may not be amiss to notice. The field was an old sod of timothy and clover. Apprehending the danger of the cut worm, I delayed ploughing until after the 1st of May, to give the grass a start, which grew strong, and was ploughed under, designing it as food for the cut worms; my expectations were realized, the corn was scarcely touched by the worms, and the green grass, consisting almost wholly of *soluble matter*, from present appearances, will be no detriment to the corn crop, but *vice versa.*

From the London Farmers' Magazine.

COMPARATIVE TABLE OF SPEED.

From the Physical and Chemical Journal of Science, and the Arts of Husbandry in France, we make the following extract, which will be found no less curious than useful, and cannot fail to interest our readers:

	Feet per second.
The ordinary rate of a man walking, -	4
Of a good horse in harness, - -	12
(Or 2,000 toises (yards) in minutes.)	
Of a reindeer in a sledge, on the ice,	26
Of an English race-horse, - -	43
Of a hare, - - - - - -	88
Of a man casting a stone with all his force, - - - - -	60*
Of a good sailing ship, - - -	19
Of the wind, - - - - -	82
Of sound, - - - - -	1.038
Of a cannon-shot (24-pounder) -	1,300
Of the air which returns into space so divided, - - - - -	1,300

From the London Mechanics Magazine.

SOAP FROM FLINTS.

Mr. Sheridan takes the common black-flint, calcined, and reduces it to powder by wet-grinding; then mixes it with the caustic soda leys, or potash leys, and boils it till it attains saponification. The mixture so obtained† is added to the present soap materials after the latter have been boiled to that state when they have become soap, and are ready to be poured into the frames. The mixture, which has a high detergent quality, requires to be well crutched along with the soap materials; and when thus crutched together, the result is a soap of excellent quality. The mixture becomes intimately incorporated with the soap materials, and may be added in proportion of from 40 to 50 parts of the mixture to 50 of the soap materials. Thus the common silex, which is obtainable at a very low price, takes the place of tallow to the extent nearly one-half.

From the Rail Road Journal.

MANUFACTURE OF COKE.

Extract from Professor Renwick's *Application of Chemistry to the Useful Arts.*

Coke bears the same relation to bituminous coal, which charcoal does to wood, and is, like it, obtained by distillation at a red heat. Bituminous coal is a compound of carbon, hydrogen, and oxygen, in very various proportions. In the variety called cannel coal, the proportion of hydrogen amounts to 5½ per cent. In the Liverpool coal it is about 3¼ per cent.; and in the slaty varieties does not exceed one per cent. The quantity of carbon varies from 75 per cent. in cannel coal, to 90 per cent. in that of Newcastle. The proportion of oxygen in cannel coal is about twice as great as would suffice to convert the hydrogen into water; in the Newcastle coal about four times as great; and in the slaty varieties, it but little exceeds the proper relation.

Coals may be divided into three varieties:

1. Those which contain at least three per cent. of hydrogen, and, at most, as much oxygen as will convert half the hydrogen into water.

2. Coals which contain oxygen in such quantity as to convert two-thirds of the hydrogen into water.

3. Coals which contain oxygen enough to convert the whole of the hydrogen into water.

The first of these varieties fuses when heated, and the excess of hydrogen uniting with a part of the carbon, escapes in the gaseous form; by the formation and escape of gas, the coke is rendered light and porous. The second variety fuses also, but the quantity of gas formed is not sufficient to render the coke porous; it is therefore compact and massive.

The third variety does not fuse, and the escape of the vapor of water reduces the mass to the form of powder.

Coal of the first class increases in volume when it is coked; the other two varieties yield coke in less volume than the coal employed. In their uses in the arts, the first furnishes the most valuable coke; the last that of least value.

Coke may be prepared in iron cylinders or retorts, but this is only done when the volatile products are to be collected; this method will therefore be described when we treat of the preparation of gas for illumination. Treated in this way, cannel coal yields about fifty per cent. of coke, and that of Newcastle as much as eighty per cent.

When the distillation is performed at a low temperature, the weight of coke is increased, but its volume and porosity are diminished. It is therefore advantageous, when the volatile matters are not the principal object, to effect the decomposition of the coal by a sudden and high heat.

Preparation.—When coal is rich in hydrogen, it may be readily coked in heaps resembling the *pits* used in preparing charcoal. The coal must be in pieces having not less than three or four inches in each dimension. The heaps are conical, having a base fifteen feet in diameter, and a height of about thirty inches. The heap may be best covered with straw, on which is laid a layer of moist earth, the straw being so applied that the earth cannot enter into the spaces between the pieces of coal. But as the use of straw is expensive, it is more usual to cover the large coal for about the height of a foot from the ground with smaller pieces, and the outside with coal-dust; the top of the heap is covered with the refuse coke which is left in the form of powder, in handling that obtained in previous operations. The heap being finished, a few lighted coals are dropped into an opening of six or eight inches in depth left in the top; the space is then filled up with fragments of coal, and when the combustion has fairly commenced, the whole is covered with earth or refuse coke. The rest of the process is much the same as that of preparing charcoal, but is easier, as coal when in mass will not continue to burn altre the gaseous matter has escaped, unless new surfaces be exposed to air.

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* We believe this calculation to be incorrect. A stone cast with strength of a man's arm would outstrip a hare.

† The compound here alluded to is a combination of silica (silex) and potassa (potash,) and is frequently called liquor of flints. Silica is a body still generally ranked with the *earths*, which it resembles in many points, but it is, in its chemical relations, an *acid*, combinining with alkalis, and forming salts, which are called silicates. It may be considered a curious fact, if the above statement be correct, that this weak mineral acid should be able to take the place of the weak animal or vegetable acids united with alkalis in ordinary soaps.

In heaps of greater diameter and height than we have described, the combustion would be too slow at first to form a porous coke, and so rapid at the end as to render it difficult to extinguish. Yet so large is the quantity of coke which is required in some instances, and particularly in the manufacture of iron, that heaps of so small a size would be attended with inconvenience. The shape of the heap is therefore changed in such case from a cone to a long prism. The breadth of this must not exceed fifteen feet, nor its height three feet, but its length may be unlimited. This prism must be set on fire in the mode we have mentioned at several points on its upper edge. In this way not only may a greater quantity of coke be prepared at a single operation, but the time is shortened, the conical heaps requiring three or four days for their conversion into coke, while the prisms are finished in twenty-four hours.

The product is usually about forty per cent., but some coals, that of Virginia for instance, yield fifty per cent. If a coal, in consequence of its containing but little hydrogen, does not burn freely, it cannot be converted into coke in this way. Such a coal was found in Yorkshire, (England,) in association with minerals which would render the manufacture of iron profitable. In order to apply it to this purpose, an intelligent manufacturer (Wilkinson) imagined the application of a chimney, for the purpose of obtaining a more powerful draught. This chimney is conical in form, about a yard in height, and as much in diameter at bottom; the diameter at top is two feet; it is built of brick, the lower courses of which are laid in such manner as to leave openings. Around the chimney the coal is piled in a heap, whose radius is about six feet greater than the outer radius of the chimney. This heap is composed of alternate layers of large and small coal, the lowermost layer being of pieces of the largest size. The surface of the heap is covered with ashes or refuse coke, and fire is applied by throwing burning fuel into the chimney. Wet ashes are kept on hand to close any cracks which may occur in the cover of the heap. Dense smoke flows from the chimney, and is followed by a blue flame; as soon as this appears, the top of the chimney must be closed by a plate of cast iron and the combustion will speedily cease.

The coal of Pittsburg, Pa. as far as we can learn, must resemble in quality the coal employed by Wilkinson; for although far removed in character from anthracite, it has not hitherto been converted into coke by the use of the mode first described. We cannot but express our belief that the method of Wilkinson would be found sufficient for the purpose, and that by its aid the manufacture of iron from the ores might be introduced into that city, which at present receives almost all the pig iron used in its extensive foundries and forges, from the opposite side of the Alleghany range of mountains.

This method has also been introduced, with some modifications in Staffordshire, where the coal is of better quality. Here the coarser coal is placed in contact with the chimney, and the finer at the outside of the heap, the whole being covered with ashes, or refuse coke, leaving a few openings for the admission of air. As soon as the coke is finished, water is poured on the heap to extinguish the combustion. In this way the product of coke is raised from forty to fifty per cent.

All the methods of which we have spoken require that the coal should be principally of that size which is of most value for other purposes, namely, in coarse fragments. Much however of all good coal is reduced to dust in its extraction from the mines, and in the handling it must undergo. This, in most parts of England, is totally lost, and it has even been necessary to burn it in heaps in order to get rid of it. In France, where coal is more scarce, and consequently of more value, it has become an important object, that none but such refuse coal should be converted into coke, and the coarser pieces left to be employed for other purposes. This object has been successfully accomplished in the neighborhood of St. Etienne.

The heap in which the coal is burnt may have the form either of a truncated cone, or oblong truncated pyramid. The latter form is most easily constructed, and described. A case of plank is formed, having the desired figure, say a base of fifty or sixty feet in length by four feet in breadth, a height of 3½ feet; and the planks are so inclined as to make the dimensions of the upper surface two feet less in each direction than that of the base.

The planks which form the ends of the case are each pierced with four holes: one at the base, one directly over it and near the top, the other two at half the height of the plank, and in the vertical plane of the upper edge of the sides. Each side is also pierced with three ranges of holes, having the same arrangement in quincunx as those of the ends, and at the same distances.

These holes serve for the introduction of tapering spars. The spars of the lowermost layer are passed through the holes in the sides and ends, at right angles to the respective direction of these surfaces, and at the angles where the spars meet each other, vertical spars are set up. The second range of spars is inclined to the sides in such manner as to meet the vertical spars; and the third layer has the same direction as the first.

The fine coal is prepared by mixing it into a paste with water, by means of a hoe. It is then thrown into the case, and well rammed upon the lower range of spars, until a bed has been formed to receive the second range of spars. This latter range being placed, more coal is thrown in and rammed, until the height of the third range of spars has been reached, and this being introduced, the rest of the case is filled in the same manner.

In order to lessen the expense of the wood employed, the heap may be built in successive portions, each ten or twelve feet in length, and when one portion has been finished, the planks and spars are removed to enclose and form passages in a second portion. The spars form conical passages in the mass, by which air may be admitted during the combustion. When the heap has thus been completed and covered with ashes and refuse coke, all the wood is removed, and the heap is set on fire by igniting small heaps of coarse coal upon each of the openings left in the upper surface by withdrawing the vertical spars. It has been found that in pyramidal heaps, about $\frac{1}{20}$ part of the coal to be coked is required for this purpose; but in small conical heaps, where a single vertical spar will suffice no more than $\frac{1}{40}$ will be used.

The attention of the workmen must be directed not only to close the cracks which may appear in the cover, but to keep the passages left by the spars open by means of iron rods. The completion of the process is known by the cessation of the flame. Water is then introduced into the lower passages, whose steam in passing through the incadescent heap is decomposed, and furnishes hydrogen which escapes in flame. The heap is then covered closely with earth, and left until it cools.

In this way coal which would otherwise be lost, yields fifty per cent. of coke of excellent quality.

When coal of the first variety (with the exception of cannel coal) is distilled in close vessels, it yields from seventy to eighty per cent. of coke, by the combustion of about ten per cent. of coal. As the best of the methods we have yet described yields no more than fifty per cent., and the most common of them no more than forty, there is obviously a very great waste. In the neighborhood of coal mines this is more than compensated by the simplicity and facility of this process. But at a distance from mines a more economical process is necessary, unless coke can be transported from this vicinity, which is by no means easy, in consequence of its friable character, and its being liable to injury by being wet. The best apparatus for this purpose is called the coking oven. This is formed of a cylindrical wall about two feet in height surmounted by a dome, from the summit of which rises a chimney about eighteen inches by twelve inches, having an iron shutter. The coal is introduced through the chimney, and spread by a rake over the floor, to an uniform depth of about four inches. Burning coals are then dropped through the chimney, and as soon as the ignition is fairly commenced the door is closed. When a blue flame begins to appear at the chimney, the top of it is closed by a plate of iron. In this method about one-half more coke is obtained than by the ordinary heaps.

Large spheroidal kilns, and reverberatory furnaces have also been used, but their principal object was the preparation of the coal tar. As this article has not proved to be of any great value, and is besides produced at gas-works in quantities greater than can be consumed, it is unnecessary to describe these kilns and furnaces.

It may be here mentioned that turf or peat may be carbonized as well as coal or wood. The fuel thus produced is of very excellent quality, and may be applied to the same purposes as that obtained from wood or bituminous coal. Pits, as used in preparing charcoal, have not been found well adapted to the preparation of the charcoal of turf. The little that has been made of good quality was prepared in iron cylinders, but as this is too expensive for manufacturing purposes, it appears probable that if it should ever be necessary to carbonate turf on a large scale it will be done in kilns like those described under the head of charcoal.

AGRICULTURAL CONVENTION.

To the Editor of the Farmers' Register.

October 15*th*, 1836.

Shall we or shall we not have another convention? If we shall, when will be the best time of meet? How can a sufficient interest be excited to secure a numerous assemblage of agriculturists? Which course will be best to pursue—the heretofore-utterly vain and self-degrading begging a wilfully deaf legislature to do something for our fast declining agriculture—or, zealously and actively to exert ourselves, independently of legislative aid, for its resuscitation?

These questions are propounded, at present, in the earnest hope of eliciting, both from yourself and other good friends to the great cause of agricultural improvement, such opinions and suggestions as may, and, I trust, will rouse all the planters and farmers of our state from their long and deadly lethargy, to a just sense of their present condition; and to a unanimous determination no longer to neglect the means, still in their power, of arresting the general abandonment of our native homes, for strange and far distant lands.

Having taken the liberty to lead the way in asking the questions, I will also suggest a few such answers, as I hope will be satisfactory, together with some brief arguments in their favor, by way of inducing others, much better qualified than myself, to aid in exciting all the true friends and real lovers of our good old mother Virginia, to exert themselves publicly, and with effectual activity to save her from the desolation and ruin with which she is so seriously threatened, by the abandonment of her soil and the desertion of her children in her hour of need.

To the first question I answer, aye! a response which I most earnestly hope will be re-echoed from every quarter of our state. My argument for it is, that as all agree in the necessity of *doing something*, there is no better way than to hold a convention of the friends of agriculture, to ascertain first what is best to be done, and then to devise the ways and means of doing it, instead of trusting it to others, who, even if they know how, have never manifested the slightest inclination to do any thing in our behalf. The best time to meet, I should suggest, is in ten days or a fortnight after the meeting of the legislature; before the usual party quarrels and battles get fairly, (I ought rather to say, *foully*,) under way; for after *that*, all matters of internal policy and state-interest are left, generally, to take care of themselves. I name not this period from any expectation or wish, that the convention should ever again apply to a Virginia legislature—constituted as it now is of agriculturists in *name only*, and not in *principle*—for any aid whatever; but because some members of the latter, might also be members of the former, and would have more leisure, and possibly more inclination to attend, before their minds and tempers get bedevilled and distracted with their party conflicts; and in humble imitation of the highest authority in our country, I name the second Monday in December for the meeting. If you also name it, in your Register, I am very confident that it will be generally approved as most convenient. Another reason is, that peradventure, the convention might resolve on something which would make it necessary to require at the hands of their honors, at least a naked act of incorporation to carry it into effect; and a first application in such cases, has always some advantage, provided it be in regard to some matter which cannot, by any possibility, be turned or twisted into a party-question: for if it can, farewell to justice—farewell to truth—farewell to all the great interests of the state, should they seem to conflict with the interests of party. This has been more or less true of all the parties I have ever known or read of; and therefore, I hope you will not exclude the remark from your Register, as contraband.

As to the third question—"how can a sufficient interest be excited to secure a numerous assemblage" at the proposed convention? I fear that it is much more easily asked than answered. But having *committed myself* to reply, I must take, in making the attempt, the old shooting-match rule, "stick or go through." Here goes then, at a venture. I would suggest, that you yourself, Mr. Editor, and a few more such good friends of the cause, should earnestly invite, through the columns of your paper, every true agricultural son, both native-born and adopted, of the Ancient Dominion, to attend this convention, either in person or by proxy. The latter might certainly be done by all, for one man might represent a county or district. I would farther suggest that the members of this convention should come prepared, *not to separate* until something definitive, and bidding fair to succeed, should be determined on. Such determination might be much facilitated, if you and your correspondents would avail yourselves of the numbers of your Register which will come out before the meeting, to propose and recommend all such plans as you may deem best to effect our objects; and especially such as could be effected without troubling our *mis*-representatives either with our wants or wishes—than which, nothing I think, would be more futile or humiliating. Moreover, it would be an act of extreme folly on the part of the convention: for if we sons of the soil, and livers by it, *will* so far forget our own best interests, as to choose our law-makers solely for their real and imputed prowess in fighting political party-battles, we have no imaginable right to expect them, either to know or to care for any thing else. "*Occupet extremum scabies*,"—"the devil take the hindmost"—is both the law and the gospel of all party-men, however imposing and specious their self-assumed titles may be—and as agriculture *must necessarily be hindmost*, where the victories of political party are the only objects aimed at, or cared for, by the law-makers of the land, the agriculturists who knowingly and wilfully elect such men to represent them, deserve the worst that can happen to them. They, the electors who act thus, are in fact, much better subjects for a lunatic hospital, and a strait waistcoat, than agents to exercise the elective franchise for the general welfare. *The general welfare!* God save the mark! It is the despicable lip-service of the unprincipled demagogue, at the same time that it is the heart-felt, the constant rule and guide of the true patriot, under all real and imaginable obstacles; and the facility with which the former, the most despicable animal in all God's creation, can impose himself on a credulous and confiding public, for the latter, the noblest of God's creatures, is one of the most disastrous, the most deadly evils to which our free institutions are exposed. This blot, this stigma, this foul cancer on our body politic might forever be extirpated, if the sound sense, sound principle, sound patriotism, (of all which, thank God, we still have a goodly stock in our dear old state,) would only make common cause of it, and forever discard both from their service and confidence, every human being, from a president of the United States to a scavenger in the streets and sewers of a town, (or, if there is any lower office, even from that,) the individuals who would sacrifice the general welfare—the national good, to party-interests. Pardon me, Mr. Editor, if my zeal for agricultural improvement, which I most conscientiously believe to be the life-blood of national welfare, has led me a little out of the track which I had determined, in the beginning of my letter, to pursue. You may castigate me as much as you please, in your Register, if you will only permit me to speak for myself, "*verbatim et literatim*," as I have addressed you. If any of your readers should be disposed to censure what I have said, pray turn them over to me, and if I do not justify every word and sentence of this communication, let the sin and the punishment be inflicted, not on *you*, but on myself; for *I* can testify, (on oath, if necessary,) that your editorial privilege of excluding altogether, or "*expunging*," when requested, as in my case heretofore, every thing which you deemed objectionable, has been exercised with the strictest and most conscientious scrupulosity. That you *have been*, in a few, *very few instances*, somewhat too fastidious, according to my notions, I avail myself of this opportunity to tell you; but I must say, that, "*take you for all in all*," there is no man on whose taste, and judgment and principles, I have more reliance as to all matters to which you have directed your particular attention. This is no compliment, my good sir—but the unvarnished truth, and here stated to prove, as far as one witness can do it, that in your editoral character, you extend neither partiality nor favor, even to your best friends.

But let me return to my suggestions as to the means of exerting sufficient interest among our agriculturists, to insure a numerously attended convention. In addition to those already stated, let the Register and its most active correspondents unite in summoning the agriculturists of Virginia, to "hasten to the rescue." As a class, we are in extreme jeopardy; and it is only by a very general and vigorous co-operation, that we can emerge from our present most forlorn and portentous condition. Virginia land-owners and cultivators must, aye, *inevitably must* "give up the ship," (to borrow a phrase from our nautical brethren,) or sink with her, unless they will unanimously resolve to do what is indispensable to keep her from foundering, in a sea wherein no true gallant seamen would ever desert her. This course of action is, to require, in every case, of those for whom we vote to represent us, that they shall never fail to promote the interests of agriculture, by every fair means in their power; and that they should never again show their faces among us, as candidates for re-election, without sufficient evidence that they *have* thus exerted themselves. Our constant failure to require, nay, to demand such evidence, is one of the principal, if not the chief cause of the present depression of Virginia agriculture; and in a moral point of view, is little, if any better, than committing political suicide. "Clod-hoppers" we are by name, and the proofs that we are so, in reality, are stronger than I am able to encounter. Nay, we have been sarcastically, and I fear justly, compared to *sheep*, ready to be sheared, without resistance, by all who know the value of our fleeces better than we ourselves do; and the comparison will be perfectly just, until we learn to claim, as *our right*, that rank in the scale of national value, importance, and respectability, to which we are justly entitled. Never, *no never until then*, can we expect to be used or treated by our governments, either state or federal, as any thing better than insensate tools or instruments to work with, in promoting their respective political party purposes. *Will you*, my friends and brethren, lend yourselves to any such base, self-degrading, unpatriotic course? Will you not rather assert your rights, and take the only steps necessary to secure, not only *their* recognition, but active and persevering efforts to cherish and promote them. Those steps are to elect agriculturists, both in profession and legislative practice, to represent you. In other words, to elect men who will, *at all times and under all circumstances*, deem it their primary duty to promote Virginia agriculture as the chief element—the cardinal principle—the only true basis of Virginia welfare and relative importance in the union of the states. *Neglect this duty to ourselves*, (I may add to the whole American people,) and we may be hugged and kissed to our hearts' content, so long as we will consent to be used as passive tools for party purposes; but we may certainly count on being utterly forgotten, and trampled upon afterwards, until wanted again. *Neglect this*, and we may whistle or sing, (as the fit prompts us,) an eternal requiem to our professional claims, our rights, and our just standing in the community. It is strange, most passing strange, that the agriculturists of Virginia, who indisputably constitute, *at present*, by far the most numerous class in our community, should still be so blind, or so wilfully regardless, both of their own importance, and of the extent of their power if they would only exercise it as they so easily and justly might do, for their own and the general good. It is yet more strange, that all the other classes, although far less numerous, should constantly act with so much stronger, more efficient, and more sagacious regard to their own particular interests: thus palpably contradicting the common adage, that the majority always rules. I *must* believe, until our national statistics convince me to the contrary, that *the landed interest of Virginia* constitute an immense majority of our whole population; and upon the principle just stated, *that interest* ought to rule our national councils. But woful experience testifies to the contrary; and furnishes ample evidence to prove, that every *other* interest has the advantage in the great and continual contest for legislative preference. *Why it is*, or *should be so* I must leave to more competent judges than myself to decide. But the fact is no longer doubtful; for as far back as I can recollect any thing of Virginia legislation, it has been utterly negligent of the great agricultural interests of the state, if not hostile to them, at the same time that a very large majority of our legislators have always been owners, or cultivators, or both, of the landed property of the state. It has been vulgarly said, that "it is an ill bird which fouls its own nest;" but I *may* add, that it is a far worse bird which causes its own offspring to perish, either from neglect or wilful mismanagement; yet *such a bird* most aptly represents our class. Shall this, my brethren, *always be true*, in regard to us agriculturists? Shall we be forever justly liable to the charge of greater ignorance or greater negligence of our own interests, than any other class in the community? Or shall we not rather manifest our real strength and exert our full legitimate power in directing and controlling our state legislation, for the general good? This question we must speedily decide, and act upon such decision with all our numerical and moral force, or patiently submit to be "*hewers of wood and drawers of water*" for the remainder of our self-degrading and most humiliating existence. Our only escape from such debasement seems to me, most indisputably to depend upon our unanimous, constant, untiring co-operation as a class; in other words, upon our making it a rule for ourselves—never to be departed from, that in electing men to represent us in a legislative capacity, we should make devotion to the agricultural interest the next most important prerequisite to moral honesty. Another rule should be, to encourage more frequent meetings in bodies as numerous as could conveniently be collected; call them what you please—agricultural societies, conventions, or any thing else, provided always, that *mutual concert for mutual good*, which must necessarily include public good, be invariably the object of all their consultations and measures. If such a course were steadily pursued, only for one year, I verily believe that death itself is not more certain, than would be some legislation in our favor, as well as a very general improvement in the whole husbandry. Let us meet then, in convention, on the second Monday in December, (if you will only divide with me the responsibility of naming that day,) and make at least one more effort—*not to petition the legislature*, for they have no ears for us or our affairs, if we may judge of the future by the past; but to ascertain how far it is possible to exert ourselves in our own behalf. Should we make nothing but "a water-haul," (as the fishermen say,) we shall at least be better satisfied than we can be at present: and *that alone* is a boon well worth purchasing at such an expense as the meeting would cost us.

Now, and at all times your friend,

COMMENTATOR.

We unite heartily with our correspondent in desiring to call attention to the Agricultural Convention, and to induce the fullest possible attendance, in the manner pointed out in one of the resolutions of the former convention, which we shall republish below. As to the views of our correspondent in regard to the procedure, or the best means of effecting the great object that every member and every individual will seek—the improvement of agricultural practice and promotion of agricultural interests—we shall now express no opinion: but invite all to the discussion, in the hope that the stirring of the question in this manner may cause many to think maturely on the subject, and lead to a well digested, combined and successful effort.

In one minor matter, we differ from our correspondent, and must therefore withhold the concurrent action which he requests. The former Convention fixed what was then thought the most suitable time for the next meeting—and whether it was so or not, its being so fixed, would make an attempt at alteration inexpedient, and probably injurious. Independent of this consideration, we still believe that the time fixed by the former convention for the meeting of the next, is on the whole the best.

Extract from the minutes of proceedings of the Agricultural Convention, Jan. 13, 1836.

"Resolved, That it is recommended by this body, that an Agricultural Convention shall again meet in the City of Richmond, on the second Monday in January, 1837, to be composed of delegates from the several Agricultural Societies in Virginia, and from any public meetings of members of the agricultural interest, in counties and towns where no such societies have been organized."

Communicated for Publication in the Farmers' Register.

REPORT OF THOMAS BLANCHARD, ESQ. ON THE UPPER ROANOKE NAVIGATION, IN REGARD TO THE USE OF STEAMBOATS.

To A. Joyner, Esq.

Agreeably to your instruction, I have examined the Roanoke River from Rock Landing, at the entrance of the canal, to Clarksville, in Virginia, for the purpose of ascertaining the practicability of navigating the said river between those points, by steamboats, and beg leave to submit the following remarks.

The present sluices, or most of them, are altogether inadequate for steamboat navigation; and in some places the fall of water is too great, to be overcome without locking. I have therefore made such remarks as I thought necessary, on the falls and shoals as I passed along, taking the names of the different places as given me by the boatmen: but the distances between the obstructions, I could not accurately get, and have omitted them altogether.

The first rapid shoal that came under my notice, is called the Old House Ledge. It is a rapid of about 30 rods long—the fall of water in the distance about two feet, and the water in the sluice, about two feet and a half deep. This shoal can be made navigable for steamboats, by deepening the sluice at the head, and giving it a more gradual fall, or inclined plane.

2nd. Eaton's Falls. The fall at this place is about ten feet, and is overcome by a short canal and lock. The latter will admit the passage of boats of only seventy feet long. The entrance to the lock requires straightening, and to be made deeper: the canal will require to be made straight, and some wider.

3d. Allen's Falls. The first rapid was about two feet fall in a short distance—was found to have two and a half feet water in the sluice, and must be improved. The second rapid, in the same falls, is much the same as the first, and can be sufficiently improved by sluicing.

4th. Hamlin's Shoals. The first bar is along side of an island—the rapid is short, and water very strong. The second bar is a ledge of rocks, extending the whole width of the river—the water in the sluice two feet deep, the fall two and a half, in fifteen or twenty rods. The third rapid is in all respects much like the second; the head of which, is the foot of the fourth sluice, which has a stone wall, and is shoal and rapid. The fifth sluice terminates these rapids. They are about two miles long, and form a continued succession of shoals the whole distance—the bed of the river being wide, the bottom composed of solid rock, and the fall more than sixteen feet. To make these shoals navigable for steamboats, locks are necessary. To improve them by sluicing, would require one regular inclined plane over the whole of them, making a fall of water of about ten feet to the mile, which is as great a fall as can be overcome to advantage.

5th. Bullard's Shoals. These shoals are three-fourths of a mile long, and about four feet fall in two short rapids—the sluices of which are crooked and shoal. They can be improved by extending the sluices with side walls, and using dams and making them deeper.

6th. Pugh's Falls are about three-quarters of a mile long, having a fall of six feet. Here are the ruins of an old lock, which it will be necessary to re-construct, or build a new one. A short distance above this place, on the south side of Cotton Island, is a short rapid of about two feet fall, breaking over a ledge of rock, extending from the island to the opposite shore. The water is deep both above and below, and nothing more is wanting but to cut a sluice through the ledge.

7th. Lizard Creek. There are two rapids at this place, about one-fourth of a mile long. The first has a fall of about three feet in twenty rods—the second is not so strong, but both will require improving by locks or long sluices.

8th. Collar Bone Falls. At this point the water falls about two feet in thirty rods, and can be sufficiently improved by deepening the channel at the head of the sluice, and making a wall up the side of the north shore, thus forming a long sluice.

9th. Black Shoals. The fall here is about eighteen inches, in two short rapids, and can be easily improved by cutting sluices.

10th. Horseford Falls. The whole extent of these falls, is nearly two miles, but the greater part of the fall is in a distance of three-quarters of a mile, having a fall of about six feet, the whole fall being eight feet. The main fall is over a stratum of rocks the whole width of the river. One lock of about six feet lift would be sufficient for these falls.

11th. Short's Falls are one mile long, and can be improved by sluicing.

12th. Bug's Island Shoals, require to be made deeper and straight.

13th. Butcher's Creek Shoals. These falls are too rapid to be overcome without lockage—the most difficult place is around Eagle Point, where a wall has been constructed. The sluice is crooked. A dam of five feet lift would raise the water sufficiently for the two first rapids; the others can be improved by removing rocks, and making the sluices straight.

14th. Johnson's Sluice Shoals, are more than a mile long; the sluices are too narrow and crooked; the turn too short around the island. The sluices must be made wider and longer.

15th. Clarksville Falls. At this point there is a fall of about three feet. The sluice through the milldam is too short and rapid for steamboats. As here is a good mill seat, a dam and lock would be necessary for steamboats, and supplying water for a mill.

The examination I have been able to make of

Roanoke River between the points already indicated, (Rock Landing and Clarksville,) induces me to believe that five locks at least are necessary, and there are not less than twenty-five shoal places where the water falls from one to three feet in short rapids requiring improvement. Sluices have been formed through these falls or rapids for batteau navigation, but they are generally too crooked and narrow for steam boat navigation. In addition to this, between the ponds formed by the several falls, there are many secret or hidden rocks near the surface in low water, which would be destructive to steam boats, and must be removed. The sluices at places where this mode of improvement is adopted, must be so extended as to give the water a gradual fall of not more than at the rate of ten feet to the mile. This rate of inclination may be considered the maximum fall that a steamboat will overcome, taking other boats in tow. The sluices should be three feet deep, and not less than thirty feet wide to navigate them with safety. The kind of boat I would recommend for the river is 85 feet long, and 13½ feet wide, with the wheel in the stern: such a boat, if built with my patent arches, would not draw more than 18 inches water.

As to the cost of making the necessary improvements on Roanoke River, for steam navigation, it would be impossible for me to form any correct estimate, having no adequate data upon which to found such estimate for work in this part of the country.

THOS. BLANCHARD.

MUD WALLS DEFENDED.

To the Editor of the Farmers' Register.

Richmond, (Va.) Oct. 23, 1836.

An absence from home during the past summer has prevented my reading, of late, your interesting journal as usual, and it is but a day or two since accident threw in my way, the September No. of the Register, in which I noticed, for the first time, Mr. Herbemont's reply to my remarks upon Mud Walls.

Mr. H. sets out by accusing *me*, (such pretensions are never wanting to a warlike enemy,) of "waging war" against him, and veteran as he is—always ready—he takes advantage, anticipates the offensive, and opens his batteries upon me, with the most merciless discharge of irony and satire. Now although my adversary has resorted so unprovokedly to the "*ultimo ratio*", and thus placed matters between us, according to all rule, beyond the pale of treaty, I have still too much respect for the adage at which he hints, to answer him in his own way, unless his temerity shall force the necessity upon me. I even implore a *truce*, and shall endeavor in the mean time to *confirm* peace by assuring Mr. H. that I intended no "attack" or "irony" by my remarks, and that in speaking of him, and his article upon *Pisé*, I really *intended* to do so with the utmost respect and courtesy—and if indeed I have done otherwise, it is purely attributable to my awkwardness, for I utterly disclaim any "*malice prepense*" in the whole matter.

Having thus made the honorable amend, I cannot help remarking, Mr. Editor, how discouraging it is, to say the least of it, to have one's *maiden essay* so unmercifully assailed, especially by such a *veteran* of the pen as my adversary. "*Est modus in rebus*"—but verily, Mr. Herbemont has forgotten this maxim of moderation, in his attack upon me, and what he is pleased to call *my* mud walls: for pushing his advantage to the utmost, he throws back upon me the whole weight of what he is pleased to call my "*most undoubted* highly *respectable name*," and not content with this, he proceeds to inflict the "*coup de grace*," in the form of the most merciless irony by the superposition of my "*four*" poor worn out, *old field* Virginia plantations! mud houses and all! I pray my adversary, have mercy! I really never intended to give to the public an inventory of my old fields: but in truth, 'twas *indiscreet* in me to be talking, ah! *publishing* (*that's the rub*—) about *four plantations, old fields*, or what not, in these agrarian and democratic days: it is I find, too palpable an innovation upon the delicacy of public sentiment upon such subjects. Well! we must all pay for our experience, and as I am young yet, I shall hope to grow in discretion as I grow in years. But I must confess that I had expected a little more forbearance at the hands of a liberal and chivalrous gentleman of South Carolina. But enough! I now, in the words of Mr. Herbemont, "most cordially and in all sincerity offer him the hand of peace and friendship, and beg to be considered by him only as an humble fellow-laborer in the field of usefulness."

Mr. H. tells us that the Tower of Babel was built of mud, and that there are sufficient remains for this fact to have been ascertained by modern travellers—and Mr. H. takes credit to himself for this, his *heroic assistance*, as he calls it, in enabling me to establish the antiquity of mud walls. But I can't say that I am less sceptical about these *travellers' stories* than Mr. Herbemont himself. In short, I am willing to let the *facts* stated by me at first, stand just as they are—and will not permit Mr. H. or any one else to provoke me into a crusade in their behalf, even to the Tower of Babel. If the facts are worth nothing let them go for nothing.

PHILIP ST. GEO. COCKE.

OBSERVATIONS ON ARTESIAN WELLS, AND ON THE CAUSES OF THEIR FAILURES.

Translated for the Farmers' Register, from the *Annales de l'Agriculture Francaise*, for August, 1836.

[At various times, we have, in the Farmers' Register, given information of new and important facts in regard to Artesian, or overflowing wells—and have urged the extended application of this important discovery to new locations, and for new purposes, in this country. In France, the art of well-boring has rapidly extended, and is more and more engaging the attention both of practical and scientific men. In this country, it has attracted but little attention, and has been rarely put to use, except in the calcareous region of Alabama, where pure, or spring water could in no other way be obtained, and where the solid and homogeneous nature of the soft rock, (through which the borings penetrate for several hundred feet,) has rendered continued tubing unnecessary, and has made the

works both cheap and durably operative. But it is not only where the want of drinking water *compels* Artesian wells to be made, that they are wanted, and would be highly profitable. There are few situations, not abundantly supplied with pure springs and streams, in which Artesian wells would not be worth far more than the cost of construction—and nearly all towns, and all works moved by water power in cold climates, would derive eminent advantages from them. But, besides the prerequisite of convincing the public of the important use of these wells, there is needed the aid of science to ascertain and make known the laws that govern overflowing waters, and that would direct where they may be obtained—and the aid of art and experience, to avoid errors in the execution of the work. For the latter purpose, the following extract will certainly be useful to all persons who may design commencing such undertakings—and, perhaps, also to those who have already prosecuted those works with a satisfying degree of success. Even if the observations of the author should not induce the use of some means to avoid the waste of the ascending waters, we may at least profit by learning from him this important and encouraging fact—that a diminution of the flow of water which had been once obtained, does not prove a diminution of supply from the source—but merely that it is wasted in its course, by the operation of causes which more care would have prevented.

We here shall give only the general remarks of the writer, and his more particular directions as to the tubing of bored wells. His subsequent statement of the purport of M. Viollet's memoir we postpone for the present—and may omit entirely, if the memoir itself (which is promised in the September No. of the *Annales*,) should be more satisfactory, and is suitable to be translated for this journal.

We have not stated the American equivalents of the various French measures of dimensions mentioned in the following article, because they are not important except to persons who design to make practical use of the information, and they can by them and others be easily estimated, by reference to the explanations of French weights and measures given at p. 119, vol. iii. and in other parts of this journal, and various other works.—ED. FAR. REG.]

Extract from a *Report made to the Society for the Encouragement of National Industry, by the Viscount* HERICART DE THURY, *upon a Memoir of* M. VIOLLET, *Civil Engineer, at Tours, concerning the application of observation and calculation to the dynamic action of Artesian wells, and upon the heights at which it suits to take the water, to put to use its entire power.*

Gentlemen:—M. Viollet, civil engineer at Tours, and member of this Society, has addressed to you a memoir upon the principal Artesian wells of that city and its environs. According to the manner in which he has treated the various questions considered in this memoir, a more appropriate title would have been, *A Theory of the application of calculation to the dynamic action of the water of overflowing wells, and upon the heights at which it is proper to take the waters, so as to make use of their whole power.*

The memoir of M. Viollet is, in truth, a theory entirely new, or until now unperceived, and spoken of by no one, before this able mechanician. To him, and to M. Saget, engineer of mines in the Department of Indre-et-Loire, to whom he says he was indebted for the first idea, belongs the priority: and I do nothing more than my duty in declaring, that, during the twenty years in which I have occupied myself with the art of bored wells, and in which time I have had communication with our best mechanicians, for the employment of the overflowing waters of these wells, no one has communicated any such theoretical ideas, on the application of calculation, as has now been done by M. Viollet.

Other persons may, with justice, claim the invention of the prior use of the overflowing waters of bored wells for working machines established in localities which were, until then, deprived of running waters: others will claim the application of these waters to wheels moved by other water, to the end that by their warmer and constant temperature they might hinder the formation of ice in winter on the wheels—and consequently, prevent the necessity of the stoppage of the works, which before was often caused during very cold weather. Other persons may also claim the application of the waters of bored wells to the warming of workshops and green-houses, by making them flow uncovered through such places, during winter; and others have used these waters to make artificial cress-beds, and for irrigating land, &c. But, I repeat, no one, before Messieurs Viollet and Saget, had thought of applying calculation, and algebraic formulas, to ascertain the dynamic power of Artesian wells. To them then, and especially to M. Viollet, belongs the first idea; as it is to M. Champoiseau, merchant of Tours, that is due the honor of having opened, in this country—notwithstanding the risks foreseen and willingly encountered—of having opened a new career to industry, in the employment of the overflowing waters of bored wells.

Thanks to you, gentlemen, to your offered prize, to your encouragements, our bored wells are extending more and more. They are now made in all parts of France—in England, Italy, Germany, Prussia, Russia—in Asia, Africa and America. But I will also say, that, in many places where they are attempted, the trials are made too slightly, and often, with an eagerness and zeal too little regulated by reason and reflection. It is not to be believed that all countries present equally the conditions necessary for obtaining overflowing waters. No! unhappily, no! Differences and difficulties are produced by the physical construction of certain regions, the nature of their rocks, and the manner of their position—the raisings, the upsettings, the breakings, the dislocations, which the strata have undergone since the information—in short by many causes, upon which I cannot now dwell, and to which I shall return elsewhere, because it is important to study them, and to know them well, before the boring for water can be carried on to the best advantage.

But these causes do not operate in the department of Indre-et-Loire, in which Mr. Viollet has conceived his theory of bored wells, since each trial there has been crowned with success, and the success is so much the more remarkable, as the quantities of water obtained successively in each well have always been increasing since the first boring.

To make borings, to pierce the earth to reach spouting water, is not all that is necessary in constructing Artesian wells. The greatest difficulty does not lie there. When the ground is favorable, and the necessary conditions are presented, we may easily bring to light, and make overflow at the surface of the earth, the springs of subterraneous waters: but the great difficulty is to maintain and preserve the entire volume and force of water which the source furnishes, and preventing any after diminution of its quality, power or effect. Such is the true difficulty, such is the principal rock that the Artesian well-borer can strike upon. On this account, in my divers reports upon the principal bored wells with which I have had acquaintance, have I always particularly dwelt upon the necessity of tubing them with the utmost care, and through their entire depth. In truth, earth which appears most compact often presents numerous fissures, or cavities, or beds of sand and gravel, of which the boring may not show the true state, nor the degree of permeability. The subterraneous water, in rising, at first filters through the passages imperceptibly: but if this infilteration is allowed to continue, it soon increases: it opens, it rapidly enlarges the at first small issues, then the waters spread through the earth; they make way for their passage, and soon or late, they are lost entirely.

I have often cited examples of excellent bored wells, which had been the admiration of the country, which had caused a general enthusiasm to prevail, to that degree that none doubted but that there was under the country a subterraneous sea ready to rise up wherever the earth was pierced: every body wanted to have bored wells, so that the workmen could not serve the demands which arrived from all sides. But soon this ardor subsided; and the admiration ceased almost as quickly, when it was seen that the overflowing waters rapidly diminished, and soon even ceased to rise; and this entirely for want of proper care and precaution in the tubing of the wells. I have even reported an example perhaps, the most striking, that of a bored well, the waters of which, as abundant as impetuous, after having inundated the garden of the proprietor, who, as he said, only wished to have a little river and lake, (in the style of English garden,) but of which the waters, in their fury acknowledged no dike, no obstacle able to arrest their course, overthrowing the partition walls, and even overflowing the adjacent grounds, to such extent that the proprietor, not being able to govern the water, was condemned to make a subterranean aqueduct, to rid himself of the excess of his river, and to prevent the occurrence of new disasters. But his aqueduct was not yet finished when he had the grief of perceiving his cascades successively to become feeble, his river to diminish, and next even to cease to flow, because his well had not been tubed its full height; and because, for mistaken economy, he had besides, committed the fault of using tubes made of common sheet tinned iron, which, being quickly destroyed, suffered the rising water to be lost in the sandy and permeable beds of earth traversed by the well.

In his communication, M. Viollet says, that being charged with applying the motive power of the water of a bored well to a manufactory, he deemed it necessary previously to study the various bored wells of Tours, in order well to ascertain the power of the water of which he could dispose, and to assure himself whether the supply was constant: but that frequent measurement of the volumes discharged had soon convinced him of a progressive diminution, which he attributed to the wells not having been tubed through their whole extent; that consequently they experienced considerable waste from filtration, and a gradual decrease, which had not been perceived at first, because that the wells bored for the municipal administration of the city of Tours, sent their combined waters to different public fountains, through subterraneous conduits.

It was in studying thus the power of the Artesian wells of Tours and in repeating successively the measurements of their products, that Mr. Viollet conceived first the principles of his theory —of which the application appeared to him doubtful and uncertain when he had established the progressive diminution of the power—but upon the success of which, however, he was re-assured, when he arrived at the certainty that the Artesian wells always preserved their full power, when they had been tubed through all their height, and with proper care and precautions.

The examination of the memoir of M. Viollet having led me to speak of the decrease of the waters of bored wells, in consequence of the defects of the tubing, I think it proper to suspend my remarks for a moment, for the purpose of introducing some developements upon the tubing of wells, one of the most important operations of the well-borer, since on it the success of the work generally depends.

There are used, to tube bored wells, pipes either of wood, of cast metal, of iron, of sheet iron, of sheet tin (*fer-blanc*, tinned iron,) of zinc, or of copper.

1. Pipes of wood are used for wells of no great depth, or which do not exceed 40 to 50 metres. In Artois, there are wells bored at a very remote epoch, the ages of which are not known, which are lined with wood which has never needed repairs, unless at the upper extremity, at the open air, and which part has to be renewed once in 20, or 25 years, and often in less time. These pipes are made like those for pumps and fountains, of the wood of alder, elm, oak, &c. The wood of alder is generally preferred to the two others: it is easy to bore, is less dear, and is very durable. They bore these pipes laid horizontally, with an auger worked either by hand, by horse power, or by a water wheel. They give to those pipes a diameter of 0.10 millimetres to m. 0.20. Their length is as great as the bodies of trees that can be had without defects. The joinings of the pipes are made by the end of one pipe being cut to enter in the end of the next, and the joining encircled and secured by a hollow cylinder (*frette*,) of metal.

2. Pipes of cast iron are used by different well-borers, in preference to pipes of wood; and yet they offer some serious inconveniences, according to the nature of the ground, and of the gas or other principles contained by the water. These pipes unite with each other by the one end entering and fitting into the other, with soldering,

brazed, or with *mastic de fontenier*. The diameters of the pipes are from m. 0.10, to m. 0.20. and even m. 0.30. These pipes are also subject to the danger of being sometimes crushed under the blows of the rammer, by which they are driven down. Still, notwithstanding these objections, tubes of cast iron are often used with success in France and in England: but it is necessary first to test their strength, and to be assured of the quality and nature of the metal before they are used.

3. Pipes of sheet iron resist injuries better than the cast. None but the thick hammered sheet iron should be used—not the *tole laminée*. The thickness of the sheets used is from m. 0.005, to m. 0.006. These pipes are united by brazed soldering, and by being fitted in each other and fastened with iron pins, which are *counter-sunk*, or lost in the thickness of the sheet iron. The diameters of these tubes are from m. 0.10, to m. 0.20. These pipes are used with the greatest success, when sheet iron of the best quality is the material. Some persons have these pipes tinned, to prevent their oxydation, and the consequent coloring of the water. This precaution is very good; but it requires much care, and presents difficulties in the tinning of the joints. In short, it is important not to use, for cheapness, sheet iron that is too thin, because it is decomposed quickly, and when holes are thus once made, they suffer the ascending water to escape into the permeable earth.

4. Pipes of common sheet tin [that is, of very thin iron washed with tin,] have been used in England, and their inconveniencies have been evident, on account of their weakness, and their quick decomposition. They ought never to be used, unless as temporary and provisional means, for want of, or while waiting for permanent pipes. Still it is preferable to make use of pipes of thick sheet iron, well tinned, having care that the joints are again well covered with tin, as it is apt to be exposed at the cut, or place of contact of two pieces of pipe: when they receive a double tinning, it is said, they are not liable to any causes of decay, and are perfectly well preserved. They are from m. 0.20, to m. 0.25 and m. 0.30 in diameter.

5. Pipes of zinc, from m. 0.10, to m. 0.20 in diameter, have been used in some bored wells, in preference to sheet iron tinned, for cheapness. But these pipes are not always of long duration. They are subject to be speedily decomposed, and last but a little time in certain kinds of earth, which appear to exert upon the zinc a powerful decomposing action—or rather, perhaps, from the effect of the galvanic action which is exercised between the zinc and the iron of the boring instruments. Thus zinc tubes should not be used except for temporary purposes, and in that case, sheet iron tinned would be preferable.

6. Pipes of copper are not so costly as might at first be supposed. They are not subject to decay or destruction, and are employed with the greatest success for the great bored wells of public fountains, and of factories. Thus, at St. Denis, at Tours, at Elbeuf, &c. bored wells have been tubed with copper: and as the metal used is only from m. 0.003, to m. 0.004 in thickness, the expense of the material has been compensated by its small degree of thickness, and the advantages of the unalterability of copper, after its surfaces are bronzed.

I think that pipes of wood, alder, elm, or oak, may be made use of with success in wells which are not more than 40 to 50 metres in depth: but that the preference should be given to pipes of copper when the wells exceed that depth, or when, from the nature of the ground, there is reason to fear great difficulties in putting down wooden pipes: since a well once tubed with copper, will never need repairs.

The prices of tubing vary according to the material used. Thus—cast iron pipes, according to their diameter, are worth from 12 to 15 francs the running metre: hammered sheet iron, at 2 francs the kilogramme, 18 francs the running metre; and pipes of red copper, at 4 francs the kilogramme, are from 25 to 27 francs.

As to the precautions to be taken in placing the pipes, the most essential, and those which should be particularly recommended to well-borers, are these: 1st. To put down tubes of ascension (or those in which the water is to be confined in ascending,) as low as the deepest hard and impermeable bed of earth which lies immediately over the water-yielding bed, from which burst up the overflowing waters: 2nd. To pour behind the tube of ascention, whether between it and the earth, or between it and larger temporary pipes, a cement or *grouting* of hydraulic lime of the best quality—which is strongly objected to by many, even to this time. One of the best examples of tubing, thus executed, and which deserves to be considered as a model, is that which Mr. Degousée has constructed in the well bored under his direction in the *Abattoir* of Tours.

For the Farmers' Register.

WHICH IS THE BEST ROUTE FOR A RAILWAY TO THE SOUTH-WEST?

A writer over the signature R. N., in the Farmers' Register for September and October, has brought before the public a plan, or route, for a south-western railway, a part of which is practicable, and will be useful and profitable if carried into effect. A part I consider badly located; and nothing but actual survey, and mature consideration of the various interests affected by the railway, will enable the public to determine on the proper route. Some of the general principles laid down by R. N. are undoubtedly correct; but he has not, in my opinion, in laying out his work, conformed to his principles. His views are too general; so much so as to serve and forward but few particular interests; and if but a small portion of the special interests of the state are benefited, it follows of course that the general interest is but little promoted. My object however is not to enter into discussion with R. N., but to lay before the public my own plan for a south-western railway, or railways; and all I ask for it, is a just decision after actual survey, and comparison with other routes. I cordially concur in the sentiment, that public advantage and interest ought under no circumstances to be made to yield to individual interest. In such a work as a road or railway, however, the term "public and general interests" must have a more limited meaning than that which would make it embrace the whole state of Virginia, the city of Richmond, the James River and Kanawha Company, &c. I mean that there are some great and important improvements that ought to be made, even though they might not directly benefit the city of Richmond, or promote the interest of the James River and Kanawha Company, or benefit directly that portion of the state lying on James River. I am no enemy to these great interests: I wish to see Richmond a first rate city, and think that every one who loves Virginia ought to wish success to her great central improvement, which is progressing under the care of the James River and Kanawha Company; and for the whole state, I am in favor of a liberal system of internal improvement. The south-western railway is a work more particularly for the benefit of southern and south-western Virginia. Richmond and Petersburg as the ultimate markets and shipping ports for this south and south-western country, have their interests too; and Petersburg being the natural market of my part of the country, I shall discuss the subject more especially with a view to the interest of that town. As a general remark, the truth of which will be admitted, no doubt, I would state as a fact that improved roads to market, railways and canals, chiefly originate with, and are made by the enterprise and capital of the towns; hence it is important to the success of a great work, that such advantages be offered to the towns as to enlist them in favor of it, and thereby get command of the necessary capital to carry on the work; and if you by the work improve the market towns in the line of the improvement, as a matter of course you render important service to the country around about and convenient. A railway from the tide water of James River to the south-west, extending to the limits of the state, is a work called for by the wants of an extensive and fertile country, is a practicable work, and will beyond dispute, pay a good interest on its cost. That I do not assume too much in this proposition, is proved by the fact, that this extensive country is extensively and profitably employed in making bulky articles for market, and sending them to market over the worst and most expensive roads in North America. And surely if it can prosper under such a system, how much more must it prosper when its burdens are diminished by the facilities of a railway, and this railway maintained by one-fourth of what it costs the farmer to use the present roads? To be the most beneficial, this railway must, as far as practicable, pass through those counties farthest removed from navigation, and at the same time capable of affording the greatest amount of tonnage for the road. The proposed railway is a great and costly work, and one which cannot be executed, unless every important interest can be reconciled and combined, and be brought to use their power and influence to promote the object. One important matter is to settle the manner in which this great work shall connect with the tide water. In this great work, as I have before stated, Richmond and Petersburg both have important interests. A large portion of the interests of these two cities can be made common and the same, in the execution of the great work; but in some respects their interests are rival, and so far each town must provide for its own peculiar interest. It cannot be expected that Richmond will lend her aid in constructing a railway from Petersburg to the south-west, or that Petersburg would assist in making a railway to the south-west from Richmond, or that Richmond or Petersburg either would submit to a continuous railway passing through to carry trade to a rival town. It would be absurd to expect it. What town or city ever thus acted? Railroads to Petersburg or to Richmond, must stop at the respective places and deposites, even though "tavern keepers and hack-men" are benefited thereby. I lay it down as settled in practice and precedent. My plan is to construct a rail road from Petersburg to Lynchburg, and from Richmond to Lynchburg, and that as large a portion of this road be common and the same as the nature of the case will admit of—and from the point where one road will cease to answer both towns, let there be two roads, one leading to each. I think if this plan is adopted in good faith, there need be no money vested in routes unnecessary and uncalled for, and the influence of Richmond, Petersburg, Lynchburg, and Farmville, and all the southern and south-western counties will be concentrated on the great work. The point where the road shall begin to be common and the same for both cities, must be agreed upon by a friendly consultation of the parties interested, and surveys on joint account made to gain all necessary information. This can be done at once, as a considerable portion of the amount required to pay these expenses is already subscribed. The route recommended by R. N., from Petersburg to the south-west, may, with some important variations, be adopted by Petersburg as her connecting link with the great south-western road. The point where sound policy will direct the roads to unite, will be either at Farmville, or on the southern ridge route to the east of Farmville. It would be a matter of little consequence to Petersburg, whether the branch from Richmond met the branch from Petersburg at Farmville or at some intermediate point east of Farmville, as the improved navigation of the Appomattox will secure to her more of the trade of Nottoway and Amelia than she has heretofore enjoyed; and as the whole work must be undertaken and executed by one company, it will be well to fix the location of the Richmond branch so as to insure the greatest profit to the stock holder. This view I think would place the branch from Richmond, on the ridge between the James and Appomattox Rivers. This location through the heart of the counties of Chesterfield, Powhatan and Cumberland, would leave to this branch extensive trade and travel, sufficient perhaps to support it, and pay fairly on the capital expended. No difficulties present themselves on this route until the crossing of the Appomattox River at Farmville, and this a slight one, as the ground is even and the slope gradual. This portion of the route, from Raines' Tavern to Farmville, has been already surveyed and estimated. From Farmville the route would cross Buffalo River near its junction with the Appomattox, and by an easy ascent attain the summit of a ridge which is even and unbroken to New London. This ridge must be the location until you approach Lynchburg within a few miles; that town can then be reached by one of the ridges which set off at right angles to the main route. The importance of making Lynchburg a point on the line, will be readily admitted by all who will consider that it is one of the largest inland towns in the state, a place of great and increasing trade, which is attracted to that place from north, south, east and west, and that it will be probably the starting point for the rail road to the north-west, extending to the Ohio, as well as the starting point for the rail road to the Tennessee line. It would be absurd to pass by such a place as this, if we could do so. It is the point where we may expect to meet as much trade and travel as will give full occupation to those to the eastward of it, with both its branches. There is another route which has been spoken of for the continuation of the Richmond ridge road, that is through the county of Buckingham on the north of the Appomattox. This route offers too many difficulties, and no peculiar advantages as compared with the route on the south side of the river, to be selected. R. N. recommends from Petersburg a route on the great ridge dividing the waters of the Appomattox from those flowing into the Albemarle sound, passing by Nottoway Court-house, Chalk Level, and around or across the head branches of Bush and Buffalo Rivers, and on the same ridge as it meanders to New London. I recommend the same route from Petersburg to Chalk Level or Burk's Tavern, a distance of fifty miles, from thence to Farmville on a level ridge a great part of the way, a distance of fifteen miles, and the distance by the railway will be near about the same with the public road, and no difficulty in this section greater than will be found on the other route. The railway will descend by an easy and practicable grade along on the east side of Sandy River, to the mouth of Bush River. The crossing will not be difficult or expensive, and thence the route to Farmville will be quite easy. The distance from Farmville to Lynchburg does not exceed fifty miles, making the whole route one hundred and fifteen miles. Great and immediate advantages are offered to Petersburg by the early construction of the railway on the southern ridge route. The trade and travel of the counties of Dinwiddie, Nottoway, and parts of Lunenburg, Mecklenburg, and Amelia, would fall to this railway; and considering the increased tonnage which would be caused by this improved way to market, there can be but little doubt that these counties would support the road, independent of the tonnage and travel additional after arriving at Farmville; and the continued increase as the road advanced to the westward. All passengers to Norfolk, and those preferring the steamboat route to the northern cities would prefer the southern route, as well as all who are going north and have business in both Petersburg and Richmond. When the rivers are obstructed by ice, goods put on the railroad at City Point would seek this route, as James River is often closed above City Point when it is not below. The great general advantages to be gained by the adoption of such a plan as this, are, in the first place, the combination of the influence and enterprise and wealth of all the towns interested in the southern and southwestern trade, for the execution of the great and important work of a south-western railway. Secondly, the whole south and south-west of the state gain the advantage of an easy and cheap way to market; and a choice of markets and increased consumption for the products of the country. Petersburg will be particularly benefited, by receiving a share of the western trade; and all that part of Virginia for which Petersburg is the natural market, will be benefited in proportion as that town is increased in capital and trade. The Charlotte Convention has been brought into the discussion by R. N., not very much to its advantage. This convention was called by somebody from some quarter unknown to the writer; with the avowed object of considering the propriety of a survey of a rail road from Farmville to Danville, passing near Charlotte Court-house; and I think its resolutions might easily have been construed to recommend a railway from Petersburg by Farmville to Lynchburg, from Richmond to Farmville, and then by a common route to Lynchburg, and a rail road to Danville from Farmville. If this last should ever be accomplished, it will afford additional employment for the eastern branches of the great south-western rail road which I have endeavored to recommend. From my acquaintance with Farmville and its people, I think I can clear that little town of the presumption of demanding or recommending that all these great works should pass through her limits. The improvements have been recommended by strangers as well as friends; and that place would be strangely blind to its own interests, if it were to remain indifferent to such offered advantages, and to the advantages of location which it possesses.

It is proposed above that the whole work of a south-western railway should be done by one company incorporated for the purpose. If however the road from Lynchburg to the Tennessee line be secured under its present charter, it will form a part of the great south-western route, and ought to be begun at Lynchburg at the same time that the road I have recommended shall be begun at Petersburg and Richmond. The route from Petersburg to Lynchburg or New London, through Farmville, is shorter than the route on the ridge which passes around the head springs of Bush and Buffalo Rivers; and offers the advantages of the trade of Cumberland and Buckingham, which would be lost to the other routes, as well as all other trade and travel concentrated at Farmville.

The above plans and routes for railways are submitted to the public. The subject is interesting to southern Virginia, and if no other good is effected, the writer hopes it may cause its further discussion by those who are more experienced.

E.

Oct. 3, 1836.

Extract from the (London) Farmer's Magazine for September, 1836.

THE EFFECT OF SOOT ON WHEAT.

I had last week an opportunity afforded me by a friend who farms on a dry and inferior soil, of witnessing the effect of the application of soot on young wheat in the spring. The field to which I now allude, has been partly dressed over at the rate of thirty bushels of soot to the acre, and it is quite astonishing to see the benefit that it has afforded to the crop of wheat. Nothing can be more conclusive as the virtue of this description of dressing, than the experiment which I am now speaking of. The field was sown with wheat out of a clover ley, without any manure being laid on, the whole of the piece having been previously to this year farmed in an exactly similar manner.

The field perhaps is seven acres, and about four acres (the poorest part of the enclosure) were selected for sowing the soot on, the remaining three acres not having any soot applied. I have no doubt but that at harvest there will be eight bushels of wheat more an acre on the part that was sooted, than there will be on the part to which no soot was applied. The cost of the soot was sixpence a bushel, being at the rate of fifteen shillings an acre for thirty bushels. The whole of the expense attending the dressing will not exceed twenty shillings per acre, the increase of the value of an acre of wheat will be forty-eight shillings, or eight bushels of wheat at six shillings a bushel, thus leaving a net profit of twenty-eight shillings per acre after deducting the cost and expenses of the soot; and as to any additional labor brought about by an extra crop, such as reaping, thrashing, harvesting, &c., the increased quantity of straw will entirely liquidate.

From the [British] Veterinarian.

IMPORTANT TRIAL.

A cause very important to the farmer and the veterinary surgeon was tried at the Nottingham Assizes on the 24th ult. We present our readers with the substance of it.

The plaintiff, Mr. Jackson, of Stapleford, near Nottingham, was owner of several parcels of meadow land, through which ran a small stream of water of excellent quality. It was called the Syk Brook. Near its source is a *cromlech* in unusual preservation. It is one of the most perfect Druidical remains which the midland counties possess; and a legend is attached to the brook, that in days of yore, the sick used to resort to this spot, and, after certain Druidical incantations and ceremonies, and drinking of the water which ran beneath the cromlech, they were cured of all their diseases. However this might have been, these meadows had been in the possession of Mr. Jackson's family for some centuries, and the cattle had always done well.

Thirteen years ago the defendant, Mr. Hall, erected some buildings for the manufacture of starch near the brook, and above Mr. Jackson's meadows. No change was observed in the water, or the condition of the cattle for the first two or three years; but at length the water used in the manufacture of the starch found its way into this brook in considerable quantities, and then the milk of all the cows rapidly diminished, many of the cattle became seriously ill, and in the course of some years no fewer than twenty-six of them died, and all of a disease accompanied by nearly the same symptoms, and the fish and the frogs which had peopled the brook all died.

In the manufacture of the starch the wheat from which it was obtained was first ground. It was then macerated in water until the gluten was dissolved and the starch precipitated, and the bran was left floating in the tank. It had now underwent very considerable fermentation, and the whole mass was in the highest state of putrefaction, and exceedingly offensive both to the taste and smell. The liquid containing the dissolved putrefied gluten was now drawn off, and was preserved for sale. It was supposed to be an excellent manure, and for a while there was considerable demand for it; but at length it lay upon hand, and was thrown away, and took its course down a ditch into the Syk Dyke, and that, occasionally in a quantity greater than the original stream.

The bran underwent various washings, and, being sufficiently cleansed, was given to the pigs.

The starch, however, required another process in order to fit it for use. The smell which hung about it was to be taken away, and the starch was to be bleached. For these purposes a solution of the chloride of lime was employed, and when that had done its duty, it too was turned into the stream.

Sulphuric acid was also used in considerable quantities, in order to perfect the manufacture. That also ultimately found its way into the water-course.

At length the defendant yielded so far to the remonstrances of the plaintiff as to construct a *sough*, or circular tiled drain, through the plaintiff's grounds, by means of which the empoisoned water was conveyed to a river at some distance, the volume of the stream of which was supposed to be so considerable as not to be materially affected by admixture with these deleterious ingredients.

This being effected, the fish and the frogs began to return to the brook, and the weeds grew on its banks, and the mortality seemed to cease among the cattle; but the defendant refused to make compensation for the cattle that were previously destroyed. In order to recover this compensation, an action was brought.

[The voluminous evidence, we omit.]

Verdict for the plaintiff, £270 damages.

From the (London) Farmers' Magazine, for September, 1836.

CULTIVATION OF POTATOES.

Sir:—I observe it stated, that in some counties there is a great failure of the potato crop; this, I think, may be remedied by sowing the seed. Sets will not last above twelve or fourteen years; after that time they decline, and hardly return treble seed. I tried the experiment last year, in a small way, and the produce was astonishing. What is very remarkable is, that these seedlings produce potatoes of different kinds, and sometimes new sorts are procured. It is no difference whether the apple comes from one kind or another. I saved the red rough seed, and I had five sorts from it.

The following is the method I took, to get them the size of hen's eggs in one year:—Take a bunch of potato apples, of any sort, in November, when they are ripe; hang them up in a warm room during winter, and at the end of March, separate the seed from the pulp, by putting them into a basin of water until they are soft; squeeze them with the fingers—gently pour off the water, and sow the seeds in drills with the feathers of a goose quill in a good bed of earth. When the plants are about an inch high, draw a little earth up to them with a hoe in order to lengthen their main roots: when they are about three inches high, dig them up and separate them carefully from each other in order for planting out in the following manner. Prepare a piece of fresh ground by trenching it well, dig up the seedling plants as before directed, and plant them out in the ground thus prepared in such a manner that there be 16 inches between each plant. As they advance in growth, let them receive one or two earthings up, in order to lengthen the main root, and encourage the shoots under ground. By this management potatoes may be brought to a good size in one year.

Southmoulton, July 19.

EXCERPTA CURIOSA.

1597.—In Carrick, are kyne, and oxen, delicious to eate; but their fatness is of a wonderfull temperature; that although the fatness of all other comestable beasts, for the ordinarie vse of man, doe congeale with the cold aire, by the contrarie, the fatnesse of these beasts is perpetually liquid like oile.

1765.—There was in the parish of Braunston, in the county of Rutland, an ewe which had seven lambs, all alive, within less than a year; and when fat, did not weigh above fourteen pounds and a quarter.

1765, July 14.—A curious mare, 28 inches high, from the East Indies, was brought in a coach from Gravesend to Leicester Meuse, and after being curried and dressed, carried in a coach to Carleton-house, when it was shown to the Prince of Wales, who seemed highly pleased with it; afterwards it was carried in a coach to the Queen's Meuse. This was a fine little animal, of a dun color, the hair resembling that of a young fawn's. It was said to be four years old, well proportioned, had fine ears, a quick eye, and a set of fine teeth with a handsome long tail, and very good natured. Qy. Did she breed in England?

From the (London) Farmers' Magazine.

A NOVELTY IN BREEDING.

It cannot be too extensively known, for the benefit of breeders and fanciers of horse-flesh in general, that by pursuing the plan of Jacob of old amongst the flock of Laban, horses may be bred of any color or possible combination of colors. Dr. Thomson, of Hamilton, in the case which lately took the round of the newspapers, actually followed the suggestion of the Patriarch, and got a celebrated animal painter to take Batty's beautiful horse, which painting was placed constantly in the stall before the mare during the period of uterogestation. We know of seven gentlemen in this neighborhood (Hamilton) who are following the same course with their mares this season; and we only fear that the mania may extend among the farmers, and tend to annihilate the celebrated Clydesdale breed. An animal painter has taken a residence in town for the purpose of enabling himself to supply the demand of the country gentlemen for *fancy* horses.

From the (London) Farmers' Magazine.

MACHINE FOR THE UPWARD TRANSMISSION OF WEIGHTS.

A very ingenious machine for the upward transmisson of weights of any description is now on exhibition at the Mining Hall, next Exeter street, and deserves the attention of mine proprietors, wharfingers, and all persons who have the management of extensive stores, as one well calculated to save a great deal of time, labor, and expense. The construction of this power is very simple, and its steady operation is quite assured. Its chief agent is a pair of wheels; or, if necessary, a series moving with their diameters in the direction of the weight to be raised—say the shaft of a mine. Taking the one pair of wheels, moving on the same fixed axis, we find that from the end of a radius or arm in each, a chain descends, so as to hang on opposite sides of a square passage. To each chain are suspended, at different but regulated distances, quadrangular frames, to the upper sides of which, strong projecting iron rims, moving on the principle of the hinge, are attached. The boxes, or receptacles for the weight to be raised, have corresponding edges on each side. When the wheel above is turned, and a single box below is placed in connection with the lowest frame, it is caught by its rim, and with one revolution of the wheel is sent up as high as the frame on the opposite side to that on which it is borne: here it is again caught and sent up to the apparatus on the opposite side again, and so on, by alternate transmission, it is brought to the top of the shaft. The machine being kept constantly laden below, and its wheel constantly turned above, it follows that at each revolution of the wheel a box is delivered: and thus, in an exceedingly short space of time, a vast body of matter can be carried up through any depth of shaft. It is not easy to describe such machines, however simple they may be, in very simple or intelligible language, and we have not been much practised at specifications. We must therefore leave scientific men to understand us through their own quick intelligence; and to all others whom the matter may concern, we recommend the employment of their own eyes. The machine could be most humanely employed in great mines in quickly sending the workmen up or down, to save them from their present tedious and tiresome expedients for that purpose. In unlading ships at wharfs its operation would be found amazingly rapid and proportionably convenient. It may be remarked also, that its operation is wholly unaccompanied by danger, and that its speed may be accelerated or diminished, or it may be stopped altogether at any moment, with perfect facility and convenience. On the whole, we must confess that we were struck with the complete efficiency of this admirable invention, which we are glad to find is protected by patent.

HORSE RACING OF OLD.

The deed is still preserved among our city archives, by virtue of which the Town Cup is annually given at Salisbury races. It bears date March 28, 1654, and is a compact between Sir Edward Baynton (as the representative of certain noblemen and knights who subscribed a fund for the purpose) and the mayor and commonalty of Salisbury. Under this deed the latter received £320, and thereupon bound themselves to provide annually for ever, "a faire cupp of silver gilte with gould," of the value of £18. Among other curious regulations to be observed at the race for the cup, it is ordered, in the aforesaid deed, that the corporation shall provide yearly "three men with muskets to be charged with powder, to be discharged as followeth—that is to say, one of the said three men to stand at the first myles ende from the starting place of the said race, and there discharge his musket as the runninge horses passed by hym; one other of the said three men to do the like at the second myles ende from the said startinge place; and tother of the said three men to do the like at the end of the third myle from the said startinge place." The improvements in the speed and breed of our modern race horses have long since rendered unnecessary this very ingenious method of urging them to the goal.—*(London) Farmers' Magazine.*

For the Farmers' Register.

COMMERCIAL REPORT.

No important variations in the prices of domestic produce have occurred during the past month. Previous to that time, the current rates of tobacco had declined some 30 or 40 per cent. below those of May, June, and July. The lower qualities now command 3 to $5 per 100 lbs.; the better sorts 5½ to $7, and fine 7 to $8½, beyond which, scarcely any is sold. New *primings*, (a description of tobacco which the manufacturers apply to some use,) sell at 1 to $2 per 100 lbs. The product of tobacco has been greatly and injuriously increased of late years, by the practice of bringing to market all sorts of trash, which formerly served for manure.

The inspections of tobacco in Virginia, during the year ending the 1st of this month, amounted to 45,445 hhds. and the foreign export to 30,000, against 47,520 inspected, and 26,000 exported in 1835. Exclusive of the inspections, a considerable quantity is brought to market *loose*, and sold to manfacturers. The receipt at New Orleans, was 49,934 hhds. against 35,890 in 1835, and 24,963 in 1834. A very large increase is expected in the Virginia and western crops the ensuing season, and a consequent overstock in all markets.

Some interesting statements of the tobacco trade have been compiled, by Messrs. Riley & Van Amringe of Philadelphia, from which it appears, that in the years from 1772 to 1775, the annual export from the colonies averaged nearly 100 millions of pounds: during the revolutionary war, the average was little over 12 millions, and the cultivation of it in Europe was then commenced. It has since been continued more or less extensively, according to circumstances. France presents a remarkable instance of increased cultivation under the inducement of high prices. In 1818, there was grown 18½ millions of pounds—in 1819, 26 millions, and in 1820, 33 millions, equal to 27,500 hhds. of 1200 lbs. each.

The consumption of tobacco in France is now estimated by the government at 12 millions of kilogrammes, or about 26 millions of pounds—of which, about 14 millions is grown in France. The quantity on which duty is paid in Great Britain, for home consumption, (of all sorts,) is about 16 millions of pounds, and in Ireland, between 4 and 5 millions—together producing a nett revenue to the government of £3,000,000, or nearly 15 millions of dollars.

The export of tobacco from the United States in 1790, was 118,460 hhds., and it declined gradually to 58,000 hhds. in 1797. The price having advanced as the supply diminished, a new impulse was given to the cultivation and the export increased until it reached 103,700 hhds. in 1801. The price again declined, and the export varied from 71,000 to 83,000 hhds. until the interruption of commerce by embargo, and war; since which, it has been,

	hhds.		hhds.		hhds.
In 1815,	85,300	1822,	83.200	1829,	77,100
'16,	69,200	'23,	99,000	'30,	63,800
'17,	62,300	'24,	77,900	'31,	86,700
'18,	84,300	'25,	76,000	'32,	106,800
'19,	69,400	'26,	64,100	'33,	83,100
'20,	84,000	'27,	100,000	'34,	88,000
'21,	66,800	'28,	96,300	'35,	94,300

The greatest annual value was in 1816, $12,809,000; the smallest in 1831, $4,900,000—generally about $6,000,000.

It thus appears that the export of tobacco was nearly as great previous to the revolution as it has been since.

Of manufactured tobacco, the foreign export has gradually increased from 593,000 lbs. in 1820, to 3,818,000 lbs. in 1835, inclusive of a large quantity which is sent out of the territory of the United States without being reported at the customhouses. The quantity manufactured in Virginia, is supposed to exceed 20,000 hhds, so that only about one sixth of *that* quantity is exported, and as a great deal is manufactured in other states, the consumption of this country must be in a greater ratio, to its population, than that of any other.

The product of the crop of cotton grown in 1835, has been ascertained, and exhibits an increase of 106,300 bales on that of 1834—the receipts being thus in

	1835, bales.	1836.
New Orleans,	511,146	481,536
Mobile,	197,692	236,715
Florida,	52,085	79,762
Georgia,	222,670	270,121
South Carolina,	203,166	231,237
North Carolina,	34,399	32,057
Virginia,	33,170	29,197
	1,254,328	1,360,625
Shipped to G. Britain,	722,718	771,148
France,	252,470	266,188
N. Europe,	29,803	54,889
Other ports,	18,508	24,678
	1,023,499	1,116,603
Manufactured in U. S.	216,883	236,733

This does not include any that was manufactured south and west of Virginia, which is obtained directly from the producing country, and must be cosiderable in the states bordering on the Ohio river.

The quantity manufactured in Virginia, east of the mountains, is estimated at 8,000 bales, and as new mills are being erected, there will be an annual increase.

Some extensive mills have been commenced in North and South Carolina.

The manufacturers in Europe, and in this country, have full and profitable employment: the demand for goods having kept pace with the increase of manufacture and cultivation. High prices have induced an increase of culture in the East

Indies, from whence unusually large supplies are arriving in England.

The new crop is later than usual in this part of the country—the quality is good, and the present price, (in Petersburg,) 17¾ cents, is such as should induce the planters to lose no time in sending it to market. The crop in the western states is reported to be large, and a full one in the south, so that an increase of 100,000 bales on the product of 1835, is the least that can be expected, and 150,000 not improbable.

The apprehended deficiency in the crop of wheat is realized, and the supplies are so small that scarcely any flour is shipped from Virginia; and for the first time, the millers of Richmond and Petersburg are about to obtain wheat from Europe. Large importations of foreign wheat continue to arrive in all the northern markets; but although the appearance of the grain is fine, it does not make good flour, without an admixture with our own. The price of wheat is from $1 75, to $2 15 per bushel: of flour, 9½ to $10, and for best family $12½. These high rates induce the farmers to hold their corn for a better price than is now current, say 80 cents per bushel. The crop on the navigable rivers is a full one. The inspections of flour for the quarter ending 1st October, compared with those of last year, exhibit the following result.

	1835.	1836.
Richmond,	43,069 bbls.	16,133
Petersburg,	9,383	2,536*

An intelligent writer in Philadelphia has published an article on the subject of grain, which comprises much information. He says, "this country has been called the greatest wheat growing country, for the extent of its population, and it may have been so forty years ago, when its population was small and wheat flour constituted the most valuable article of export. But that country cannot be so called which now raises more cotton, more tobacco, and more rice, *for export*, than any other country, and at the same time produces more Indian corn than of all other kinds of grain together, and is constantly extending in the growth of cattle, sheep and swine, and in manufactures of every description. In fact, the growth of wheat, it is evident, has not increased, *pro rata*, with our population."—"The inquiry has been often made what is the quantity of different kinds of grain raised in the United States, making a fair average crop? This cannot be answered with accuracy in the present state of our information on the subject, but from the best attainable, we have estimated those crops as follows.

"Indian corn,	100,000,000 bushels.
Wheat,	50,000,000
Rye,	20,000,000
Oats,	20,000,000
Barley,	1,250,000"

The pressure for money in our great commercial cities is almost unparalleled. The rate of discount on good paper is as high as 2 per cent. per month or more. Stocks of every sort have continued to decline, and are lower now in New York and Philadelphia than at any previous period during the year. Even those which divide more than 6 per cent. are considerably below par. The monetary system of the country is in disorder: remittances cannot be made with any facility from one place to another—a difference of several per cent. is made in internal exchanges—no currency of general circulation exists—except an imaginary gold one. The large expenditures on works of internal improvement, and investments in lands, &c. require the active use of all the capital of the country; and this is prevented by the vast accumulation of nearly 50 millions of dollars in the government depositories.

The price of labor, of provisions, and of almost every thing, has advanced during the current year—common laborers are hired at double and even treble the wages formerly paid. The profitable culture of cotton has attracted to the west a vast portion of the labor of the southern states—and the extension of rail roads in every direction calls for more labor than can be spared from agriculture.

Looking from general to local matters, we find the rail roads north and south of Richmond in progress toward completion. The construction of the Raleigh and Gaston Rail Road is commenced, and about one half of the line is under contract. And no sooner is this work begun than a survey is undertaken from Petersburg to Farmville, and proposed to be continued to Lynchburg and Danville. A conditional subscription is already made, in Petersburg alone, of more than $200,000, for the stock of such a road, in anticipation of a charter.

The receipts of the principal articles of produce at New Orleans may be worth recording.

		1834.	1835.	1836.
Tobacco	hhds.	24,963	35,890	49,934
Cotton	bales,	465,103	531,366	498,895
Flour	bbls.	320,660	285,708	287,191
Sugar*	hhds.	29,582	47,018	5,677
Bacon in	hhds.	7,318	8,243	7,315
	in bulk lb.	615,324	1,519,330	851,263
Pork in	bbls.	91,985	93,381	70,816
	in bulk lb.	2,603,860	7,160,934	5,416,976
Whiskey	bbls.	32,437	36,440	33,193

As the cultivation of articles of food is doubtless on the increase, particularly in the states bordering on the Ohio, it thus appears that a greater proportion is required for the consumption of the interior, which may be readily ascribed to the vast emigration to the west.

X.

October, 24th.

FRENCH PRACTICE AND OPINIONS AS TO THE CHINESE MULBERRY.

The article of M. Loiseleur Deslongchamps on successive crops of cocoons, from which we translated some extracts for the last No. is continued at some length in the succeeding (August) No. of the *Annales*—and its conclusion is yet to come. It consists mostly of generalities, together with other and more minute directions for making successive rearings of silkworms, which would scarcely be now of any value to our readers. We shall attend to what the future continuation may offer. In the mean time, the following passages are given, as they furnish evidence, from another source, of the great and early productiveness of the Chinese Mulberry.

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* In 1832-3-4—14,590 each corresponding quarter.

* Shipped coastwise.

"Nothing is more easy now than to multiply plantations of mulberries, as much as may be wished. The kind known under the name of *Multicaulis*, or Perrottet mulberry, not only furnishes the means, by the extreme facility with which it is propagated by cuttings, but it also shortens remarkably the time which before its introduction, was necessary for undertaking the rearing of silkworms. Formerly, with the prevailing usage in planting mulberries, it was necessary to wait at least ten years before begining to feed the worms: by planting for hedges, or low stocks, as many now do, this time is reduced to half; but still five years would be required to begin."

...... "But at this time, with the Multicaulis, it is possible, (as I have already announced in a little work published in the subject,) it is possible, I say, to make a raising of silkworms fourteen months after having planted the slips of this new and precious variety—and the leaves gathered from these slips, from the commencement of the second year, will suffice for the food of a prodigious number of worms. I saw the 1st of last November (1835) at Messieurs de Grimaudet and Latour, at Villemomble, three leagues from Paris, about an arpent* of land which, in the preceding March, had been planted with 72,000 slips, at 6 or 7 inches a part, in flat beds of 4 feet width, separated by paths of 12 to 15 inches. Well; notwithstanding the dryness, which was so considerable in part of the spring, and throughout the summer, 60,000 had so well taken, that one fourth of them had grown to the height of from 4 to 5 feet—two fourths more to 2 and 3—and the other fourth, of the most feeble, were at least a foot high. I have estimated that if these 60,000 slips were left in place, in the spring of 1836 they would have produced 120 quintals of leaves, sufficient for the sustenance of 250,000 to 300,000 silkworms on the produce of 5 to 6 ounces of eggs."......

"One thing which I have not yet said, and which however appears to be important, is that the mulberries can furnish the means of raising silkworms to tenants who have leases of no more extent than 12 or 15 years, or even of but 9 years."......

ERRATA.

Page 385, line 14 of column 2, for "*nine-fortieths*," read *nine-tenths*. The error in using this uncommon fraction, was not caused by the inattention or carelessness of the printer, nor without full consideration and consultation—but was owing to the indistinctness of the figure used in the manuscript.

Page 439, line 43, col. 1, for "vol. iii." read vol. iv.

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* An arpent is about 1 1-4 acres.—Ed. Far. Reg.

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GARDEN SEEDS, TREES, &C.

WM. PRINCE & SON, Proprietors of the Linnæan Garden and Nurseries, near New York, offer to the public the most extensive collection of Garden, Agricultural, and Flower Seeds, to be found in the Union. They will supply venders on the most favorable terms, both as to prices and credit: and they will also enter into such engagements relative to agencies for the sale of their Trees, Plants, Bulbous Roots, &c., as cannot fail to be highly advantageous to their correspondents. The seeds will be supplied by the pound and bushel at low prices, or they will be furnished to any extent put up in small papers and labelled ready for retailing, on which a large discount will be allowed. Specimen beds of the different seeds are growing for inspection, whereby their excellence and accuracy are proved.

One hundred thousand Chinese Morus Multicaulis, at $25 to $30 per hundred. 15,000 Broad-leaved Florence Mulberry, at $12 to $15 per hundred, and also above 100,000 White Italian do., at $30 to $80 per 1000, according to size. Fruit and ornamental trees of every description, Flowering Shrubs, Bulbous Flower Roots, splendid Double Dahlias, Green House Plants, &c.; priced catalogues of which will be sent per mail to every applicant. The proprietors of Nurseries, and those who wish to establish new Nurseries, will be dealt with at a liberal discount.

Oct. 25, 1836. 1t

To Engineers, Manufacturers, and Mechanicians.

WE have received a supply of the most approved works on Engineering, Mechanics, &c.; nearly all of which are illustrated with numerous copperplate engravings. Among them are the following:

Pambour on Locomotive Engines, upon Railways.
The Steam Engine familiarly illustrated, by Doct. Lardner, improved by Renwick.
Stuart's Historical Anecdotes of Steam Engines, &c.
Nicholson's Operative Mechanics, with 100 plates.
Nicholson's Mechanic's Companion, with 40 plates.
Renwick's Elements of Mechanics.
Renwick on the Steam Engine.
Brinton's Mechanic's Text Book.
Baines' History of the Cotton Manufacture.
The Elements of Mechanics, by Lardner & Kater.
Buchannan on Mill Work.
Barlow on Stress & Strength of Timber.
Evans' Mill-wright's Guide; improved by Thomas D. Jones.
Elements of Perspective Drawing.
Benjamin's & Nicholson's Carpentry; late edition.

ALSO:

Kenrick's Silk Grower's Guide.
Roberts' Silk Manual.
A Treatise on the Breeds, Management and Diseases of Cattle; published under the superintendence of the Society for the Diffusion of Useful Knowledge.
Gould's System of Short Hand. &c. &c. &c.

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For the purpose of furnishing complete sets to new subscribers, I will pay $5 each for copies of Vol. I. Farmers' Register, if complete, (with title-page, index, and list of subscribers,) and not materially defaced. If without the index and list of subscribers, $4.50 will be paid for the 12 numbers.

For any of the first 9 numbers of Vol. I., 50 cents each, will be paid—or (if preferred by the person offering them,) given in exchange for the whole nine, a complete copy of Vol. II., together with a copy of the Essay on Calcareous Manures. Of Nos. 10, 11, and 12, of Vol. I., the impression was increased, and they can be furnished at subscription price, to any who may desire to have them.

Complete and clean copies of the title-page and index of Vol. I., will be bought at 25 cents.

For any number not exceeding 15 copies of each of Nos. 7, 8, and 11, of Vol. III., 50 cents each will be paid, or if preferred, two different odd Nos. of Vol II.

The Nos. will be paid for, if delivered at the book store of Campbell & Ruffin, Petersburg, Va., or to the undersigned. If sent by mail, the cost and risk of the transmission, must be borne by the person sending them.

EDMUND RUFFIN

PRICES CURRENT.--October 27, 1836.

PRICES OF STOCKS.	Par value.	Offered.	Asked.	Last sales.	Last dividend for 6 months.
BANK—Virginia—per share,	100			118	4½
Farmers',	100			115	4
RAIL ROAD—Petersburg and Roanoke,	100	116	118	116½	5
Portsmouth and Roanoke,	50				Unfinished
Chesterfield, ($53 of capital refunded,)	100		no sales		
Richmond & Fredericksburg,	100		110		Unfinished
Greensville & Roanoke,	100	112	112½	112	do.
Raleigh and Gaston,	100		100	98	do.
Richmond and Petersburg,	100			102	do.
MANUFACTURING COMPANIES.					
Petersburg Cotton Manufactory,	100		125	125	8
Merchants' Do. old stock,	100		150	147½	12
Do Do. new stock,	100	130			Unfinished
Matoaca Do.	100		125	122½	New
Manchester Do.	100			100	
Franklin (Paper Do.) Richmond,	100	90	no sales		
INSURANCE COMPANIES.					
Richmond Marine	100				
Petersburg, Fire and Marine,	100	105	106	105½	9

EXCHANGE on England, - - - - 9 per cent.

COUNTRY PRODUCE.

Wheat, red,	$1 40 to 1 90	Tobacco,	$2 50 to 8 00
white,	1 75 to 2 25	Cotton,	0 13 to 0 17½
Flour, superfine (country,) new	9 00 to 9 50	Bacon, (hog round) per lb. Western,	
City and family	10 00 to 12 50	Do. do. - Virginia,	16 to 17
Corn per bushel,	0 75		

TO CORRESPONDENTS AND READERS.

The following communications are on hand—*Product of sweet potatoes, &c.,—On corn continued on the same land year after year—On the coal deposite near Farmville.*

A communication which gave an account of an interesting and valuable fact, has been necessarily excluded, because its statements were inseparably connected with such remarks upon individuals as cannot be permitted to appear in this journal.

Newly imported Spanish Jacks, of First Quality.

I AM about to receive direct from Spain, six Jacks, selected by a competent judge acting under the direction of the American Consul at Gibraltar, whose instructions to said agent were to "purchase only *proved* Jacks, the best that can be procured without regard to price." The Spanish certificates that accompany them, describe them minutely, representing them all as either white or grey from 4 to 8 years old, and from 52 to 56 inches high. They are also certified to be "able to cover mares, and of the most approved breed for that purpose in the kingdom." If on coming to hand they prove, as is fully expected, true to their respective descriptions, they will be sold for from $1200 to $1500 each. They will be ready for delivery here, about the middle of November.

I have also on sale, two Maltese Jacks, each thirteen and a half hands high, 10 and 11 years old, and first rate breeders. Price $1000 each : also several smaller Jacks at lower prices.

The subscriber is also agent for the the sale of

GREEN'S PATENT STRAW CUTTER

Unquestionably the best implement of the kind yet invented. Price at the store $32 ; and it costs about $1 to pack and ship it. Address

I. I. HITCHCOCK.
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THE

FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the improvement of the Practice,

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

Vol. IV. DECEMBER 1, 1836. No. 8.

> And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together."
>
> *Swift.*

PETERSBURG, VA.
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EDMUND RUFFIN, *Editor and Proprietor.*

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Editor's Address— EDMUND RUFFIN, *Petersburg, Va.*

THE FARMERS' REGISTER.

VOL. IV. DECEMBER 1, 1836. No. 8.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

From the Farmers' Series of the Library of Useful Knowledge.

HAY MAKING IN ENGLAND.

The time of mowing and the mode of making hay of the different grasses—both natural and artificial—vary not only according to the state of the weather and the practice of separate districts, but also according to the uses to which the hay is intended to be applied; for, although all appropriated to the feeding of cattle, it yet differs in its estimation for the various kinds of stock; that of clover, sainfoin, and tares being chiefly employed for beasts of heavy draught, and the common purposes of the farm, while that of natural meadow grass is preferred for milch cows and saddle-horses. Thus, in the vicinity of large towns, where the color and softness of hay is more thought of by the generality of consumers than its nutritive properties, it is mown early, and got into stack in as green a state as may be thought prudent; while those farmers who expend it in the support of their own stock are more careless in this respect, cut it later, and leave it longer in the field. In some places, indeed, and more particularly in Ireland, this is carried to so objectionable a length, by anxiety to procure as large a crop as possible, that it is by no means unusual to see the harvest of meadow hay so late as the midddle of August, and left standing in the rick-yard, or *haggard*, as it is there called, until long after that time, whereby the crop is considerably injured in quality, and the intention of increase in the quantity is very commonly foiled, through the drying effects of the atmosphere. This mode of making is, however, justified by some of the farmers in the latter country, as being the necessary consequence of the superior richness of the grass, which if not thus treated, would be exposed, by its great fermentation, to catch fire;* for which there may be some foundation upon strong soils, but it can form no excuse for the generality of the practice, and it may in all cases be rendered less requisite by additional turning, or by making the stacks smaller. The lateness of the crop in some parts of England is accounted for by the general coldness of the spring on the eastern coast, which compels them to feed their mowing grounds late.* It is also thought by some persons that if the seeds of the grass be left to ripen, the hay will afford a greater quantity of nutritive matter than if cut when in flower; but the value of the aftermath thus lost is often greater than the extra nutriment gained, for the ripening of the seeds not only weakens the future growth of the plants, but the aftergrass has not sufficient time to acquire strength. Mr. Sinclair states that he has in many instances found it reduced to less than one-half in a given time after the seed crop, than when cut at the time of flowering; but he adds, that he could never observe its bad effects to extend in any degree to the following season.†

Time of Mowing.

It has been observed by the late Dr. Darwin, that while the flowering stems of grass are shooting up, and during the whole process of fructification, every species of grass—but more especially those known by botanists under the designation of the tribes of *Poa* and *Festuca*—abound with saccharine matter. This, according to his idea, is found particularly in the joints of the grasses, where a secretion of sugar takes place, and it is probable that from this source the subsequent nutriment afforded by the plant is in great measure derived. As the seeds approach maturity, this sugar is found in less abundance; and when they are completely ripe, the object of nature being attained, the stem and leaves begin to decay.

The proper time for cutting the meadow grasses seems, therefore, to be when those saccharine juices are in the greatest abundance; which appears to be when the seed is formed, but before it has arrived at maturity, for if it be allowed to grow thoroughly ripe, not only will a nutritive portion of the plant be wasted, but the land will become more exhausted than if the crop had been cut earlier. It has, indeed, been proved by experiments carefully made upon many kinds of herbage, at different periods of their growth, that plants of all sorts, if cut when in full vigor, and afterwards carefully dried without any waste of their nutritive juices, contain nearly double the quantity of nutritive matter which they do when allowed to attain their full growth and make some progress towards decay. It is, however, the opinion of many experienced farmers that the grass should be cut as soon as the first flowers blow; for at that period it contains all the useful qualities of which it is susceptible, and afterwards becomes daily more tough and sapless. Such is certainly the practice in Middlesex, which is celebrated for the quality of its hay, though probably that depends more on the estimation accorded in the London market to its color and fragrance, than to its real nutritive properties. If the cutting of the crop be much protracted, the best season for making the hay may also be passed; the plants become withered at the bottom of their stems; the roots are injured; and the aftermath is materially lessened in quantity. These remarks, therefore, suggest the propriety of watching the progress of the bents of early grasses to perfection, and of cutting the crop before they drop their seeds, although the sward of those of later growth may not then be ripe.

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* See the County Surveys of Ireland generally: Lambert's Observations on the Rural Affairs of Ireland, p. 42; and Parkinson on the Management of a farm in Ireland, p. 109. The latter writer says that "it is a custom in that country to make what is termed *tramp-cocks* (or *lap-cocks*) of hay, and to let it stand on the ground for some months, in reality until it has smothered the sward in such a manner as to destroy all the grass roots on that spot of ground; a custom that, besides, occasions a great loss of hay, by the steddle or bottom part becoming mouldy, and some of it rotting. Neither does the evil end here; for when the hay has stood so long in these large cocks, the first sweat is got over, so that when it is stacked the air penetrates into it, and it acquires a sort of fusty smell, thus losing all the sweetness required in hay. The hay which was on the farm when he entered did not fatten cattle in the same proportion as he had been used to the hay doing in England, and he is certain that this was to be attributed to its being put up in the manner described." See also Darwin's Phytologia, p. 77.

* Lincolnsh. Rep., p. 223.

† Hort. Gram. Woburn., p. 215.

Upland meadows, if well manured, will in general be ready for mowing by the middle of June, or even earlier if the summer be favorable, and never should be left standing longer than July, unless prevented by a continuance of wet weather. The first crops of the artificial grasses are always cut earlier.

Mode of Making.

There are but few departments of a farmer's business which demand more arduous care than this; for the weather can never be depended upon, and if security could be obtained on that point, the most vigilant circumspection is requisite to insure the due performance of the work, for all countries abound in bad haymakers; quantities of hay are annually wasted, and still greater quantities unnecessarily injured, through bad management. *Mowing* is indeed usually done by the acre, but *making*—as the tedding, raking, and remainder of the process is usually termed—is paid for by the day's work, and from the number of hands employed, including persons of both sexes and all descriptions, is necessarily entrusted to people who frequently understand nothing about it, and who, if not sharply looked after, idle away half their time.

In the southern counties it is generally calculated that an expert mower performs a good day's work when he cuts an acre, if the crop be heavy—if light he will do more; but in the north the labor is performed by the strongest men, who use a scythe that is considerably longer—being commonly about five feet in length—and who usually cut an acre and a half. In the execution of the work they generally point both in and out, by which means few or no balks are left, and from the great breadth of the swaths, and the close manner in which the grass is mown, their labor is very severe: they have, however, an allowance of strong beer, which is not usually given to other laborers. This mode of cutting is, indeed, in every point of view, advantageous, for the closer and the more level the grass is mown, the better will the after-grass thrive, and the saving of hay is considerable, for one inch at the bottom weighs more than two at the top; but it requires a very experienced mower to perform it well. Farmers should, therefore, be more cautious than they generally are in the choice of mowers: in their own neighborhood, indeed, there can be no difficulty, for there every man's capability is known; but when strangers are employed, much loss is frequently sustained by their incapacity and carelessness.

Mowing commences at the earliest dawn of day, while the dew is upon the ground; and when the grass is down, if the weather is favorable, the swaths should be opened with forks, and evenly spread over the meadow, during the same morning if it be cut early; but that operation is very commonly, though improperly, deferred until the next day, when the upper surface having become somewhat brown and withered, they are turned over as soon as the dew is off. If the weather continue hot, the swaths should however be immediately shaken out and tedded, or thrown about once or twice in the course of the same day, by which means the hay will be cured in the least possible time, and its color and essential juices will be more effectually retained than if it be long exposed in the same position to the sun. It should then be gathered with rakes by people working in contrary directions, into long narrow rows, called "wind-rows," and afterwards, with forks, into small "cocklets," or "foot-cocks," and left during the night, for it should be guarded as much as possible from the dew. On the following day, it must be again thrown out to the air, and if then judged sufficiently dry, it should be brought together late in the evening in larger cocks, after which it may be carried, on the third day, without any further process, to the stack. In short, the chief points to be observed are, always to preserve the hay as much as posible from dew and rain; therefore, to bring it into wind-rows, if not to cock it at nightfall; never to open it in the morning till the dew has evaporated; and not to allow it to remain too long under the scorching heat of the sun without being turned. The degree to which hay requires to be dried depends on its quality; coarse hay should be allowed to heat more in the stack, and therefore should be less made than that of fine succulent herbage.

The Middlesex practice will be found detailed at foot.* That of Wensly Dale, and other parts

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* *First day.*—All the grass mown before nine o'clock in the morning is tedded, in which great care is taken to shake it out of every lump, and to strew it evenly over the ground; for by this regular method of tedding, the hay heats more equally in the stack, and is consequently not so liable to damage. Soon afterwards it is turned, with the same degree of care and attention; and if, from the number of hands, they are able to turn the whole again, they do so, or at least as much of it as they can, till twelve or one o'clock, at which time they dine. The first thing to be done after dinner is to rake it into what are called *single wind-rows;* that is, they all rake in such a manner as that each person makes a row, which rows are three or four feet apart; and the last operation of this day is to put it into grass-cocks.

Second Day.—The business commences with tedding all the grass that was mown the first day *after* nine o'clock, and all that was mown this day before nine o'clock. Next, the grass-cocks are to be well shaken out into staddles (or separate flats) of five or six yards diameter. If the crop should be so thin and light as to leave the spaces between these staddles rather large, such spaces must be immediately raked clean, and the rakings mixed with the other hay, in order to its all drying of an uniform color. The next business is to turn the staddles, and after that to turn the grass that was tedded in the first part of the morning once or twice in the manner described for the first day. This should all be done before twelve or one o'clock, so that the whole may lie to dry while the workpeople are at dinner. After dinner, the first thing to be done is to rake the staddles into *double wind-rows,* which are six or eight feet distant from each other; next, to take the *grass* into single wind-rows; then the double wind-rows are put into bastard-cocks;

of Yorkshire, with some of the northern countries, is to cut the grass as low as possible, and on the following day, to strew it evenly and lightly with the hands; for in this part of the work they use neither forks nor rakes, unless the grass should be very light. In that condition it is allowed to remain until the day after, when it is turned with the rake-head, and is before noon raked into small rows, called "turnings;" the haymakers beginning at the side of the field farthest from the wind; and the evening of the same day, the rows are made into smalls "hay-cocks." The next morning, as soon as the dew is well evaporated, the cocks are spread carefully abroad by hand, and again before noon brought into rows. In this state, if the weather has been perfectly fine, and the quantity to be stacked in one rick is not large, it may be carried; or otherwise it is made into large cocks, and allowed to stand a few days to be lightly fermented; though not so long as to allow the base of the cock to become injured by the moisture of the ground.*

The plan recommended by Dr. Anderson and others, is—not to cut the grass until it is perfectly dry, when the swaths having had the sun for a few hours, are to be made into small cocks in a pointed shape, as narrow at the base as possible; to remain in that state during one or two weeks, according to the weather, and then to be put into larger, or "tramp-cocks," in which, after remaining a few days, the hay will be fit to stack. The benefits resulting from this practice are stated to be a considerable reduction of labor, and that the hay continues nearly as green as when it was first cut, also containing its natural sap in the greatest perfection; whereas by tedding and managing in the usual manner, its juices are exhaled, and it is more subject to become injured by rain.* Although this may be true if the weather be fine, and the hay perfectly dry when first put into cock; yet as both these conditions can rarely be attained, we do not consider this mode of making hay as generally likely to succeed. Perhaps, however, a medium between this method, and that which we have previously recommended, may be safely adopted by those who are scanty of hands, which is—not to tedd the grass so much as there described; to draw it into wind-rows instead of cocking it every evening, and only to open and shake it out for a few hours in the middle of the day; then, to make it up in the last stage into very large cocks, slightly thatched by having a little of the coarsest grass laid upon the top with the ends downwards; to remain one whole day or two, according to the weather, and then to be carried. In this manner the labor is lessened; the want of making is supplied by the partial heating of the grass in the large cocks; and under the circumstances in which many farmers are often placed, the plan has been found to answer every useful purpose. Although we state this upon the authority of a very experienced and intelligent farmer, yet it must be recollected that it is a plan which we only advocate in cases of necessity.†

Such are the modes most usually adopted; but when the weather is unfavorable, a less direct and more laborious method becomes necessary. The chief aim, then, being to secure the making of the hay with the least possible risk, the grass, after being mown, is not tedded out, but often remains for a couple of days, or even more, in the swath before it is touched; yet if a dry moment does not occur for turning it, that operation must still be performed before it has time to become yellow underneath, and particular care should be taken to turn the swaths with the heads of the rakes. After being thus dried, it must be again turned over, tedded, brought into wind-rows with the rake, and put into cocks, which are afterwards shaken out, if the weather permits, or nicely turned upside down, and then made into larger cocks, which if formed into a conical shape will stand a considerable quantity of rain without injury, until they can be got sufficiently dry to be put into stack without heating.‡ An expedient is also practised in Yorkshire to get the hay out of harm's way, when not sufficiently dry to be regularly put into stack, which consists in putting it into "pikes" or "stacklets" of about a load each. This is done by passing a rope round the bottom of each cock, and drawing them by horses, so that ten or twelve may be formed into one pike, and either left in the field, or carried upon sledges into the rick-yard, and there placed in larger pikes around the site of the intended stack. If well managed, these will not be materially injured by rain, and a slight fermentation commences which, in favorable weather, prevents too much heating when put into the stack.§ Marshall, however, says, "that it is more

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and lastly, the single wind-rows are put into grass-cocks. This completes the work of the second day.

Third day.—The grass mown and not spread on the second day, and also that mown in the early part of this day, is first to be tedded in the morning, and then the grass-cocks are to be spread into staddles, as before, and the bastard-cocks into staddles of less extent. These lesser staddles, though last spread, are first turned, then those which were in the grass-cocks, and next the grass is turned once or twice before twelve or one o'clock, when the people go to dinner, as usual. If the weather has proved sunny and fine, the hay which was last night in bastard-cocks will this afternoon be in a proper state to be carried; but if the weather should, on the contrary, have been cool and cloudy, no part of it probably will be fit to carry. In that case, the first thing to be set about after dinner is to rake that which was in grass-cocks last night into double wind-rows; then the grass which was this morning spread from the swaths into single wind-rows. After this, the hay which was spread last night in bastard-cocks is made up into full-sized cocks, and care taken to rake the hay up clean, and also to put the rakings upon the top of each cock. Next, the double wind-rows are put into bastard-cocks, and the single wind-rows into grass-cocks, as on the preceding day.

Fourth-day.—On this day the great cocks just mentioned are usually carried before dinner. The other operations of the day are such, and in the same order, as before described, being continued daily till the hay-harvest is completed.

* Tuke's Survey of the North Riding of Yorkshire, p. 174; Communications to the Board of Agriculture, vol. vii., part 1.

* See the Complete Grazier, 6th edit., p. 150, and Anderson's Ess. on Agr.

† See Batchelor's Survey of Bedfordshire, p. 443.

‡ Lancashire Report, chap. viii, section 1. Cheshire Report, chap. viii. section 8.

§ Report of Select Farms, in the Library of Useful Knowledge; No. v. p. 12.

generally made use of as a slovenly expedient for getting the hay out of hand in a tedious season; and that he has seen these pikes when opened out to be carried to the stack, white with mould, black with rottenness, and of every intermediate color, excepting that which is alone desirable.*

In the *making of rowen hay* more attention is necessary than in taking the first crop, from the greater difficulty of mowing occasioned by the lightness of the grass; so that, unless the mowers are very expert in the management of the scythe, it is apt to pass over the herbage without cutting it. This operation should therefore be performed very early in the morning, while the dew is upon the ground; but the subsequent management varies in no respect from that pursued with regard to the first crop. It is, however, fraught with considerable risk, for the grass is more soft and succulent at this period of the year, consisting almost solely of leaves without stem or stalk, and consequently requiring more time to dry up the juices: whilst at this season the dews are generally heavy, and lie long upon the ground; so that, even if the weather be favorable, but a short time occurs during which it can be freely exposed to the sun and the air, and a very small quantity of rain will have the effect of rendering it mildewed or mouldy. It is, notwithstanding, frequently cut from water-meadows for the use of cows; but it is inferior to the hay of upland meadow, for the grass not having had sufficient time or sun to give it firmness and consistence, has no proof in it, and though relished by all cattle, yet fatting stock do not thrive on it.

Clover and other artificial grasses are usually mown when the heads appear in full blossom; but rather sooner than later, as the error of cutting the first crop too early is fully compensated by the increase of the second. The proper time may be ascertained by observing the bottom of the plants; and care should be taken to mow it when the lowest leaves begin to show symptoms of decay; for if the crop be suffered to stand longer, it will lose more at the bottom than it would gain at the top. The period of this state of ripeness, depends both on the season and on the condition of the land; but in common years, and on ground in good heart, it generally occurs, for clover, about the first or second week of June, and if not then cut down, it has been found to suffer more injury than if it had been cut in an early state. *Sainfoin* is ready for the scythe rather earlier. The sooner it is cut after the blossoms make their appearance, the better will be the quality of the hay, although the quantity may not be so great; for, if allowed to stand until they all come out, the stems which first flower grow tough, and the hay thus becomes coarse and unpalatable. One load and a half, when cut out of the stack, may be considered a fair average crop of either.

An expert mower will, in the north, cut full two acres of sainfoin per day; of clover rather less: but in the southern counties, the average does not exceed an acre and a half of either, and the work must of course depend upon the richness of the crop, for sometimes the one, and sometimes the other, may be the heaviest. As the weather is at that season usually fine, and the sainfoin is naturally dry and open, the making of it into hay is attended with but little difficulty: clover being more succulent, requires greater care, and more time to dissipate its juices, as it is otherwise very subject to heat in the stack, and, if not, to become mouldy, at least to be discolored. When mown, the swaths should not be spread out, as is the practice with meadow hay, (as the plants are delicate, and easily lose their leaves, either by being shaken about, or by being much exposed to moisture,) but suffered to lie as the scythe leaves them, until they are nearly dried, which will generally be in two or three days. Then they should be gently turned over with the rake immediately after the dew is off; and, if no rain falls, the hay will be fit to cock on the following morning, and may be carried in on the fourth day.

When the clover is cocked as soon as the dew is off, the leaves will be just sufficiently tough to preserve them; but if this be omitted in the morning, and performed in the heat of the day, the leaves will have become so dry as to be partly reduced to dust, and lost in the operations of loading and stacking; although, if it has been mown sufficiently early, this is not so apt to occur, and the loading and stacking may then be continued all day without interruption. If, however, it should become too dry to be carried without some risk of loss, this may in some measure be prevented by lightly rolling the swaths over with rather larger forks than usual, keeping the load closely together, and being careful, when laying it into the cock, to avoid breaking and tossing it about, or beating it down.*

The above is considered the most advisable mode of making clover hay, though many persons, after turning it in the swaths until nearly dry, put it up into small cocks, in which it is allowed to stand for three days; after which, advantage is taken of a brisk drying day to spread it out, and in the morning to lay it in cocks of about half a ton each, in which state they remain until removed to the stack.† The making of the other artificial grasses into hay so nearly resembles this practice, that any particular statement of the modes employed with regard to *tares*, *rye-grass*, or *lucerne*, is unnecessary: they are indeed, more generally used, in a green state, for soiling; but as they are all subject to material injury from rain, the state of the weather should be watched before they are cut, and every care and activity should be employed to get them promptly into stack.

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* Rural Economy of Yorkshire, vol. ii. p. 135.

* Middlesex Report, second edition, p. 297.

† Report of the East Riding of Yorkshire, p. 171. A mode has been also sometimes adopted in Lancashire, and attended with success. It consists in collecting the clover together into small portions, immediately after it is mown, in a manner somewhat similar to sheaves of grain, and kept straight; then twisted together in the top, so as to admit of their standing on their bottom, when a little spread out; something in the same way as horse-beans are placed. In this state they are left; and if not thrown down by the winds, they will resist more rain than when lying upon the ground: or, if the weather be fine, the clover, having more extent of surface exposed, is said to become fully made in a very short time. Dickson's Lancashire, p. 504. This method, however though it may partially secure the hay from damage by rain, would in fine weather have the effect of drying it unequally; the outsides of those sheaves being too much, and the interior part insufficiently exposed to the sun; whereas the true principle of hay-making is to dry every particle alike.

The common number of workpeople is five hay-makers to each mower, including tedders, loaders, pitchers, and stackers; but exclusive of the carters who drive the teams employed in carrying the hay. There are, therefore, frequently more than twenty persons engaged in the same field; and as some management is necessary to keep them in order, a steady experienced old fellow should always be placed at their head for that purpose; for it is impossible that the farmer should himself afford that constant attendance which is requisite to the direction of each operation, and the man who would cure his hay at the most moderate expense, and with the least possible risk of losing the season, must urge those who make it, those who load and carry it, and those who stack it, to make the most of every hour, and secure it while the sun shines. Every part of the operation is done with forks and rakes, and every haymaker is expected to bring an implement of each kind; but the farmer is most frequently obliged to find both.

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Besides the light rakes of the common description, with wooden teeth, there are also some of a larger form, called "ell-rakes," with curved iron teeth, which are used for the final collection of the crop into large cocks; but a *horse-rake*, of a simple construction, which could perform the work with fewer hands, is an instrument much wanted, and if formed upon the same principle as the stubble-rake that is in use upon many arable farms in various parts of the kingdom, would occasion a further saving of time and labor. An improved implement of this kind has been lately brought from North America, and has, we understand, been successfully employed in some parts of Scotland. It is drawn by one horse, and is said to be equal to the labor of twenty persons with common rakes; but the description given of it in the Transactions of the Highland Society is so very minute, as well as confused, that we must refer to that publication for the particulars.*

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In some very steep and small enclosures, hay is also sometimes carried by a method, in Derbyshire, called *stanging;* a stang signifying a pole, two of which being laid upon the ground at two and a half or three feet apart, and a large cock of hay being laid upon the middles of them, two men take it up by the ends of the poles, in the manner of sedan chairmen, and thus carry it to the side of the stack.†

Stacking.

Great caution is requisite in the *stacking of hay;* for, if not put together perfectly dry, it is liable to ferment, and from this being exposed to catch fire, whole stacks have been not unfrequently reduced to ashes. *Hay stacks* are generally made of an oblong form, as the hay can thus be more accurately cut into square trusses than when the stack is round. The ground upon which they are built should be either raised with stones and hard compost, or with chalk, to secure the bottom from wet; or a sill of stout timber, with the bark on, should be laid down of the exact size of the stack, and afterwards filled up with faggots or with furze, covered with hurdles, for a floor. The former is the preferable plan, because it prevents rats from nestling under the staddles; but in that which is the most commonly adopted, a bottom is merely laid of faggots and irregular billets of wood, without any frame. They are erected of any size that may suit the convenience or the fancy of the owner; but those of moderate dimensions—say about 30 feet long by 12 broad at the bottom, and reckoning 9 or 10 feet in height to the eaves—are the most sightly, the least exposed to accident by heating, and will contain about 20 loads. Farmers, however, generally prefer those which contain double that quantity, both because there is less expense in thatching, and less proportion of exposed surface: the outsides always becoming dusty, and inferior to the hay which is in the interior. The ricks should stand parallel to each other, at least 10 or 12 feet asunder, that carts may have room to pass between them, as well as to keep a free circulation of air in all directions; and while forming they should be always covered with rick-cloths supported by poles, to guard them from wet, in the manner which will appear in the next volume under the head of harvest.

In *forming the stacks*, a layer of haulm, or straw, is usually laid over the staddle, and the hay is then regularly spread and even trodden down, keeping the middle rather higher than the sides. In this manner it is carried evenly up to a few feet in height, and is then made to project gradually outwards up to the eaves, so as to overhang the sides, as it is thus more effectually secured against rain. The roof is then raised to a considerable height, in a slanting form, with gable ends, and this part of the operation requires considerable care and experience in the building up of the rick. Being thus formed, the bents and blades which project outwards are pulled by hand, until the surface presents a smooth and regular appearance, and these pullings are used to top up the stack; which, after being allowed a few days to settle, is then thatched with wetted wheat or rye straw, by men who make that a business. In effecting this part of the operation, care should, however, be taken to prevent the thatchers from laying on the straw in too wet a state; for it will then injure the hay for several inches downwards. The common charge for labor is from 1s. to 1s. 3d. per 100 square feet; the small stacks being charged higher than those of large dimensions. The quantity of straw thus used in a stack containing forty loads of hay, will be about two loads of straw, and more in proportion if the stack be smaller.

Stacks are also not unfrequently formed, when of small size, quite round; and sometimes with gable ends, not too high, nor yet like a house-roof in the form of a triangle—but rather circular; in which shape they are much less liable to admit of rain passing through the thatch, and a smaller quantity of straw suffices for that purpose.

It is the custom of many farmers to *ventilate the hay stacks* by means of funnels in their interior, in order to prevent the hay from becoming mow-burnt, by drawing off the hot vapor occasioned by fermentation, and various methods are adopted to effect that purpose; such as square troughs bored full of holes, or nailed together with laths, or with sacks full of straw, which are placed upright, and the hay trod round them as the making of the stack proceeds, until the sack is nearly buried, when it is drawn up a little, and the hay laid round it as before. The advantages supposed to be thus gained are, however, counteracted by the parts on every side of such vents becoming mouldy, unless a free thoroughfare be secured for the air underneath; and in case of a current being thus admitted into the stack, it then greatly increases the risk of fire. It is, therefore, justly reprobated by every skillful haymaker, and should only be resorted to when occasioned by wet weather; in which case the danger may be partly prevented by mixing the hay with layers of straw.

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* New Series, vol. iii. p. 40.

† Derbyshire Report, vol. ii. p. 180.

It is well known that a moderate degree of fermentation, or *sweating of hay in the stack*, has the effect of communicating a flavor to it which—as exemplified in the difference between old and new hay—not only renders it more really nutritious and wholesome, but certainly makes it more palatable to the cattle which are fed upon it than such as has never gone through that operation; and the greater the quantity of sap which can be retained in the hay without endangering its being fired, or becoming mow-burnt, the more perceptible will be the fragrance of that flavor. The time of getting the hay into stack, therefore, requires considerable judgment, and depends not alone upon the state of the weather, but also upon the condition and quality of the crop. In the present parching summer we have seen some scanty crops carried off the meadows, and stacked without risk on the second day after they had been cut; for although this might have been attended with danger had the grass been succulent and weighty, yet if light crops, or those produced upon a poor or unmanured soil, were to be long exposed to the action of the sun and air, their juices would be dried up, and they would lose both in their weight and in their nutritive value. The process of drying may, therefore, be continued too long; or it may, on the contrary, be not carried far enough. Accidents of the latter kind not unfrequently happen to rich crops in fine sunny weather, which by drying the surface gives a withered appearance to the grass, and leads to the supposition that it is in a state fit to be stacked; but, the evaporation being only external, and too much of the sap being thus retained, the fermentation in the rick becomes too great, and if it should escape being fired, it at least loses much of its fragrant smell, acquires a dark brown color which increases towards the centre, and thus becomes what is termed *mow-burnt*—which is said to weaken horses that eat it, by promoting an excess of urine. In like manner, hay which has been put into stack in a damp state, besides being exposed to the same risk, is also subject to become *mouldy*—in which condition nothing but extreme hunger will compel cattle to eat it; but if neither mow-burnt, nor mouldy, farmers do not object to the color being somewhat brown, as they consider it a proof of the nutritive properties of the hay.

On what we have formerly stated in recommendation of the *application of salt* in the stacking of all kinds of hay, when coarse, or injured by the wet of an unfavorable season, it has been remarked, that if it be put into the stack wet, and rainy weather follow immediately, it must increase the dampness, as it is a well-established fact that salt attracts the moisture of the atmosphere, and, therefore, must increase the risk of fermentation.* On which we have only to observe, that, although that theory is contradicted by experience, which shows that the attraction of the salt acts upon the moisture of hay instead of that on the atmosphere, and thus checks fermentation; yet our observations did not extend to hay which was absolutely wet, but to that which is in such a state of dampness as to render it liable to become musty; and if it be merely coarse, or sapless through repeated changes of the weather, the effect of about 14 lbs. of fine salt sifted regularly through each ton of hay, when it is put into the stack, will certainly improve its quality, although it may injure its color.†

Hay barns possess the decided advantage of not only forming a secure receptacle for the hay, but also affording considerable convenience during catching weather in carrying small quantities at a time as soon as it is ready, as well as in unloading the wagons under cover, when it could not be done with safety in an exposed yard, and thus insure employment for hands which might otherwise remain idle. In winter they also admit of the hay being cut out of stack, weighed, and bound, in perfect safety, which could not sometimes be done out of doors, either with regard to the security of the crop, or the comfort of the people employed in preparing it for market. It is likewise the opinion of many farmers that hay may be put together earlier, even by a day, than it would be safe to do it in a stack. The expense of thatching hay, especially in the neighborhood of large towns where straw is dear, amounts in common seasons to about 2s., and in some cases 2s. 6d. per load; though from that is to be deducted the value of the straw as litter when the stack is cut: in hay-barns this charge is avoided; and as there is a further saving occasioned by the facility of loading the hay, and afterwards of cutting it for market under cover, these sums have, in wet seasons, amounted to something considerable. Mr. Middleton, the well-known author of the "Middlesex Survey," erected one capable of containing one hundred loads of hay, upon oak posts, in a most complete manner, at West Barnes farm, in Surrey, where he resided during many years; and he says, that the savings equalled its cost in two years: but this was aided by the then high price of straw. With this building we are well acquainted, and we can vouch that it contains all the conveniences already stated; nor, although the land is highly manured, and the hay produced upon the farm is of excellent quality, has there ever been an instance of its being too much heated. The roof is tiled, and it is boarded to some distance below the eaves: the entrance being in the centre, it forms two large bays for the reception of the crop, and affords complete shelter to a couple of wagons.

We must, however, admit that hay stacked in the same yard cuts out of the rick in rather finer order than that in the barn; and although the difference is not so great as to affect its price, it is yet preferred by those who are acquainted with the circumstance. It is difficult to account for this, for the hay is in both cases equally open to the air, and that in the barn is put together in larger quantities than that which is stacked, consequently ought to be closer, and to sweat with more effect; yet the contrary is the fact, and the same observation has been made by many farmers with whom we are acquainted. The barn is however roofed with tiles, which do not form a roof so impenetrable to the air as one of thatch; neither can the hay be packed so close to the roof; thus its sweating is partially prevented, and to this the defect may probably be attributed.

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* See Chapter xviii. p. 385.

† On this subject, see most of the County Surveys, in some of which double that quantity is recommended; also, the Treatise on the Horse, published in the Farmer's Series of the Library of Useful Knowledge, p. 357.

Grass, when dried into hay, loses about three-fourths of its weight: 400 tons in the field consequently yield only 100 when put into stack; by the process of heat and evaporation it is supposed to be still further reduced about ten per cent. in the course of the year; and if cut for sale during the summer months, the operations of cutting, trussing, and carrying to market, render it so much lighter, by exposure to the sun and wind, that it probably loses from five to ten per cent. more. During the winter, this latter species of waste will be avoided, and from this circumstance, together with others which relate to price and conveyance, farmers who do not consume their hay upon the premises, may determine the season at which it will be most advisable to dispose of the crop. Upon good land, a load and a half of meadow-hay is thought a good average: in fine seasons, and with plenty of manure, two loads are frequently made; but three loads or perhaps tons, when cut out of the stack, form the largest crop ever produced upon soils of the very richest quality.

Hay is sold in London, and generally throughout the southern markets, by the load, containing 36 trusses, each weighing 60 lbs., until Michaelmas, and 56 lbs. after that period, or 18 cwt. to the load. In many country places it is, however, estimated by the ton: at Edinburgh it is disposed of by the stone of 24 lbs. avoirdupois, delivered in bulk; for neither in Scotland nor in Ireland, is it trussed for market. * * * * *

The *measurement of hay in the stack*, for the purpose of ascertaining its weight, is made by multiplying the length, breadth, and height, into each other; and if it has been allowed to settle in the stack during the winter, ten solid yards of meadow hay, in good condition, will generally weigh about one ton. The number of yards depending, however, partly upon the old or young state in which the grass was cut before it was made into hay, and partly upon the dry or moist condition in which it was stacked, as well as upon the length of time which it has lain—all these circumstances should be minutely examined; for if it is in a very large stack of more than a year old, nine, and in some cases eight yards will make a ton; clover, lying somewhat lighter in the stack, will generally take eleven or twelve yards to make a ton; and sometimes, when it has been stacked very dry, thirteen may be required; but the average of the last year's clover may be assumed at twelve yards.*

The *expenses of making hay* consisting chiefly of labor, vary, of course, in different places. Those in the district around London being the highest, we shall state according to the last estimate, as they may be reduced according to the rates in other parts, and are as follows:—

Mowing varies from four to six shillings per acre, according to the crop; but the general price is five. Making, including the wages of all the laborers employed in tedding, carting and stacking —but exclusive of any charge for horse labor, which being performed by the farm teams is not included—is from ten to fifteen shillings, as the weather proves dry or wet, and the crop light or heavy; but it may commonly be got in from ten to twelve. Men and women will, upon an average, drink about four quarts of beer each per day, at 6*d*. per gallon—say, about 2*s*. an acre for beer; but, when the days are hot, the men at the stacks and with the carts have a more liberal supply to induce them to get on. These charges therefore amount to—

Mowing,	say per acre - - -	5*s*.
Making,	do. - - - - -	10
Beer,	do. - - - - -	2

On an average of soils and years the crop may be about one load and a quarter of meadow-hay per acre when cut from the stack; consequently, the expenses upon a load will be as follows, viz.

Four-fifths of the above sum - -	13*s*.	6*d*.
Thatching, about 2*s*. per load; but, as the straw will make bedding for cattle when it comes from the stack, say -	1	6
Binding for market - - - -	2	6
Toll-bars and carter - - - -	2	6
Salesman for selling - - - -	5	0
And if held over until the following day,	7*s*.	6*d*.

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* Baydon on Rents and Tillages, 3rd edit. p. 159. The mode of calculation is as follows:—Supposing the stack to be ten yards long at the bottom, and eleven at the eaves; four and a half wide at the bottom, and five and a half at the eaves; and presuming it to be four yards in height to the eaves, and to rise three yards to the point of the roof: in order to find the contents, the dimensions are summed up thus—

Medium length 10½ yards
Do. breadth 5
52½
Do. height 5 including ⅓ of the rise of the roof.
10) 262½ = 26¼, or 29 1-6 loads.

If the stack swells out considerably towards the eaves, the height—if taken against the sides—will appear to be greater than it is in reality; it should therefore be measured by a pole set up perpendicularly to the eaves. When it is required to measure an irregularly-formed stack, the contents may be found by giving and taking proportionate quantities of the separate parts, or by measuring or computing it in different divisions. If round, a more complex calculation is necessary, and can be hardly ascertained with accuracy without having recourse to geometry. Mr. Baydon, however, mentions a simple method, which consists in measuring the circumference at the bottom, and at regular distances up to the eaves, which must be added together, and divided by their joint number for a mean circumference; the square of which must then be multiplied by the decimal ·07958, and this product by the height up to the eaves, and one third of the rise of the roof, added together, and this divided by 27 (the calculation being made in feet) will give the product in decimal yards.

The actual outlay, in money, is therefore 25s. the load, to which must be added the expense of the team according to the distance to which it is to be carried, which may be safely estimated at about 10s. at the lowest; and as every farmer is bound by his lease—or even by the custom of the country if only holding his land upon a common agreement—to carry back a load of dung, or other equally efficient manure in return, that will cost about 4s. more; so that the whole charge cannot be calculated at less than somewhere about 2*l.* per load. This account differs but little from that furnished by Mr. Middleton in his survey of Middlesex; but he estimates the entire expense of manuring once in three years, also those of tithes, taxes, and field-labor; thus making the whole charge amount to 5*l.* 5s. per acre, exclusive of rent.*

From the (London) Gardener's Magazine.

OBSERVATIONS AND EXPERIMENTS ON THE PROPERTY POSSESSED BY SOME PLANTS, PARTICULARLY THE A'RACHIS HYPOGÆ'A, [GROUND PEA] OF RIPENING THEIR FRUIT UNDER GROUND.

There are some plants that have the singular property of ripening their fruit under ground, which are distinguished by botanists by the name of Hypocarpogèæ. Why nature has provided them with this property is not known; but it has been supposed to be similar in its uses to that possessed by some other plants, which, though they ripen their seeds in the open air, are guided by nature to deposite them only in the places most suitable to their germination and developement; by which means species are propagated that it would be difficult in any other manner to preserve. Even the Linària Cymbalària would soon become rare, did it not throw out its branches, and open its capsules over those fissures of the walls on which it grows, which are suitable for the protection of the young plant; whereas, if its seed fell on the ground, it would be placed in circumstances so unfavorable to its germination, that it would probably perish. Without some such provision, how could steep rocks be so frequently covered with cyclamens, &c?

There are plants, however, growing in situations where no particular provision of nature is required to prevent them from perishing, which yet form their fruit under ground; or, at least, bury it in the earth to bring it to maturity: though in what way this is effected, and how the earth operates upon the fruit, as far as I know, has never been explained.

To solve this difficulty, or, at least, to throw some light on the subject, I determined to cultivate the A'rachis hypogæ'a, a plant which, perhaps, possesses the quality in question in a greater degree than any other. I had thus an opportunity of making observations and trying experiments, the result of which I shall proceed to state, first giving a short description of the general habits of arachis, which will facilitate the comprehension of the subject.

The A'rachis hypogæ'a, or earth nut, is one of the Leguminàceæ. It was brought to England in 1712, and it is here considered a stove plant. It is generally cultivated in the warmer parts of North and South America, but is supposed to be originally from Africa. In South Carolina, the seeds are used as chocolate; in the eastern countries, as almonds; and in Cochin-China they furnish an oil used for lamps, and as a substitute for the oil of olives. About Paris, it is raised on hot beds, and transplanted into the open garden, where it ripens its seeds, which are used as other legumes. It has also been brought to maturity in a stove in England, and proved very prolific.—(See *Hort. Trans.*, vol. v. p. 372.)

The greater number of the flowers of the arachis originate in that portion of the stem which is nearest to the surface of the soil; some, however, are to be found a little higher up, in the axils of the leaves. The calyx of these flowers forms a tube at the lower end, which resembles a peduncle. The style is enclosed in it, and it terminates in a little ovary, at first sessile, and placed at the base of the tube. After being fecundated, the flower withers and falls off, and a small tubercle is found adhering to the stem, which, by degrees, assumes a longer shape, like that of a little horn, and turning downwards, penetrates into the soil, or sinks deeper, if it has already entered it. This little horn (which is nothing more than the fecundated seed attached to a peduncle) increases in the earth, becoming larger towards its point, till, by degrees, it assumes the appearance of the legume, or seed-pod, of the arachis.

From knowing that, in general, the parts of plants which are under the soil are either roots themselves, or are furnished with fibrils, and that they can only derive nourishment from the soil by their spongioles, the idea struck me, that the fruit of the arachis might have an analogy with roots, or might exercise a similar function in some degree: and I very soon, by observing the plant attentively, discovered even with the naked eye, a small tubercle on the extreme point of each legume, which on examining it with a glass, and afterwards with a microscope, I found to be analogous with, though it was much more distinct than the spongiole of a root. This is more apparent when the pod has penetrated the ground, and begins to develope itself, decreasing in thickness as the seed which it contains approaches maturity. From the point where the tubercle, or spongiole, appears, there are salient lines, which mark the legume longitudinally; and which appear to be formed of small bundles of vessels, or of elongated cellules.

These observations apply, not only to the arachis, to which new and suitable organs of absorption are necessary for its re-production, but to the bulb of the saffron, which essentially differs but little from seed, and which is known to throw out large fusiform roots from its base; a circumstance that I consider to afford additional support to my opinion.

Subsequent experiments have confirmed the opinion which the above observations first led me to entertain. By means of a stone placed under the legume, it was prevented from penetrating into the ground, when it was found to become elongated, and to try to change its direction; but, finally, not being able to reach the earth it withered and dried up. This convinced me that the legumes of the arachis can never be ripened in the open air.

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* Middlesex Rep. 2nd edition, p. 290.

I put another pod of this plant into a small empty phial, and set it in a place where it could not receive the direct rays of the sun. It is easy to comprehend that, while it was in this situation, the atmosphere within the phial was always moist; as, during the warm days and cool nights of autumn, the moisture combined with the air in the day becomes condensed in the night; and, in fact, the interior of the phial was found every morning covered with drops of water. The legume was, therefore, all night, and a great part of the morning, not only in an exceedingly moist atmosphere, but also completely battered by these watery drops. This kept it growing: it elongated itself, without appearing injured in doing so; and when, in the course of about a fortnight, I took it out of the vial, I found that it was still in a fit state for penetrating into the ground. A third pod, when immersed in water, became covered with a whitish film; but it lived and elongated itself, becoming somewhat thicker towards the point. I took it out of the water at the end of three weeks, and found that it had still power to search for the earth. The last two experiments prove that, although water is not sufficient for the full developement of the fruit, it is favorable to the preservation of its vitality; and that, though moisture is a condition necessary to the production of the tubercles, or roots, it is not sufficient in itself to produce them so as to enable them to exercise their functions, when all other circumstances are unfavorable.

I put another legume into a phial, in which there were a few drops of water, and buried it in the ground, so that the light could not reach it. In this situation, it soon became very long, and covered with fine hairs towards its extremity, where a swelling gradually took the form of a small legume. In a few days, the hairy covering disappeared, and the miniature ovary slowly increased in size. I took the legume out of the bottle about the time when it would have become ripe if it had been in the ground, and found it very small, with the point much elongated, and furnished with spongioles, but with only one seed, which was very small and watery. In this experiment, the legume was placed in circumstances much more favorable for the developement of the functions of its roots, than it was in the preceding ones; because, in this case, the legume was kept in an atmosphere constantly impregnated with moisture, and, what was particularly suitable to it, in perfect darkness. But why did it become covered with hair? It is well known that hair, in some cases, acts as an organ of absorption; and it is probable that, in this instance, it exercised the same functions as, and partly supplied the place of, the spongiole, which, though formed, was, from the unfavorable situation in which it was placed, incapable of performing its proper office effectively: and, indeed, the hairs disappeared as soon as the extreme point of the legume became sufficiently elongated to touch the bottom of the bottle, where, as I before stated, there were some drops of water, in which the spongiole could, though only in an imperfect degree, exercise its proper functions.

Finally, I cut off the extreme points of three legumes, and afterwards their spongioles, which were scarcely formed; and, after having done this without injuring any other part of the pods, I put them in the ground again, and let them remain about a fortnight. I then examined them, and found that two of them were dried up, and had become soft, and almost decayed. This would have proved that the spongiole was essential for the developement of the fruit, had not the third legume, which was treated exactly like the others, vegetated, and increased in size! What was the cause of this? On observing it closely, I discovered that it had still a spongiole, although the two others had not the least appearance of any; and this explained the phenomenon: as it appeared clearly, that either I had not entirely removed the spongiole, as I intended, or that the plant possessed the power of reproducing it.

From all these experiments, I think we may conclude that the fruit of the A'rachis hypogœ'a is placed by nature under ground, and in order to absorb from the earth something that is necessary for its developement (which may be only water,) and that darkness is a necessary condition. Also, that probably all plants belonging to the Hypocarpogèæ are furnished with similar organs for similar purposes; which I consider a reasonable inference, till it has been either confirmed or disproved by future observations and experiments.

From the (London) Gardeners' Magazine.

ON THE TREATMENT OF OLD FRUIT TREES WHICH IT IS WISHED TO PRESERVE; AND ON THE ADVANTAGES OF LAYING COW-DUNG AT THE BASES OF THEIR TRUNKS, AND ALSO AT THE ROOTSTALKS OF VINES.

By W. A. L.

In most old gardens there are to be found the aged remains of some favorite fruit tree, which the proprietor is unwilling to have removed, either from its having produced excellent fruit, or from early associations connected with it. Hence it still retains its place, though age, the chisel, and the pruning-knife have been hard upon it, and it remains a heartless stump, and almost leafless skeleton of a tree.

Such was the case, some twelve years ago, with a green gage plum tree, which for many years had been trained against a wooden fence 10 ft. high, and had long delighted both old and young by the yearly produce of an abundant crop of delicious, juicy, high-flavored fruit; but it was now old, and exhausted; and its yearly crops were "few and far between."

In the course of some judicious improvements, it was found necessary to remove the old wooden fence, and to build in its place a substantial brick wall. By this event, a favorable opportunity occurred to have the old plum tree removed, and a young healthy tree planted in its place. Having represented to my employer the propriety of so doing, his answer was, "I wish, if possible, to preserve it: it has produced excellent fruit, and was a great favorite with my father. See what you can do."

As many young gardeners, on entering their first situation, may be similarly circumstanced, I will relate the means I adopted, together with the result. In the first place, I cut down the tree to the lowest live wood on the bole (which, in this case, was 2½ feet from the ground,) leaving the branch 20 in. long; I then collected four barrow-loads of fresh cow-dung, and laid it round the stem to the distance of 4 feet on every side, and rising conically 6 inches above where the trunk was cut off; and, in order to conceal the unsightly appearance of the dung, I covered it with sand 2 inches thick. This was done in February; and in due time the live buds of the branch broke, and grew apace. During the heat of summer, the surface of the dung became finely pulverised; and, on examination, I found that strong healthy roots had issued from the bottom of the branch which was left, and had spread through the whole mass of dung which enveloped it. The following spring, I gave it another coating of the same, extending to the distance of 6 feet; repeating it the third year, and occasionally since. The result was, that the tree grew so rapidly, that I was soon enabled to form a handsome, well-regulated, fan-shaped head, which fills the whole space of its original allotment, and has borne, for these eight years past, excellent and abundant crops.

This is a mode that may safely be adopted with all old fruit trees that are worthy of preservation, whether cut down or not. In the latter case, I would recommend that the soil be removed to the distance of 4 or 5 feet from the bole, to the depth of the strong leading roots, and a layer of fresh cow-dung, 6 inches thick, spread on them and covered with sand, and left for one season to the influence of the sun and air. It will soon be discovered whether the cow-dung acts beneficially, by the renewed vigor of the tree, and its sending forth young wood. In this case, a judicious pruning of the old wood is necessary; and in the spring, another and more extended layer of dung should be added.

Where vines are planted on the outside of forcing-houses, and the roots have got into improper subsoil, the removal of the soil from the stem, and a barrowful of fresh cow-dung laid round them, never fails to cause the protrusion of strong vigorous roots: but it is adviseable not to begin forcing early, when it is applied, as the moisture, in very cold weather, may prevent the due circulation of the sap.

From the Augusta Chronicle.

QUICK WORK.

Messrs. Editors:—I attended a cotton packing, at the plantation of Col. James H. Hammond, Silver Bluff, on Saturday, the 24th of September, and as the achievement far exceeded any thing of the kind ever before performed, I send you an account of it for publication.

Without changing the hands, or mules, 40 bales, averaging between 320 and 330 in weight, were packed before 12 o'clock. A respite of an hour and a half was given, when the packing was recommenced; and before half past 4 o'clock, they completed the 60th bale! During the afternoon, when it may be reasonably supposed that the hands were fatigued and less active than in the morning, they turned out a bale in the unprecedented time of 6½ minutes! As 10 and 15 bales is an ordinary days work, and 30 bales the largest number ever before packed in a day, (at least in this section of country,) it may be as well to inform planters what *can* be done, by an active and industrious overseer, in command of efficient operatives. It is true that the screw is not an inferior one, yet it admits of numerous improvements; and when they are made, I do not hesitate to say, that *one hundred bales* can be packed in a day, without difficulty.

H.

TOP-DRESSING GRASS LANDS.

An important fact in regard to this matter, has been communicated to us by an intelligent visitor, viz: *that the same quantity of manure is twice or thrice as beneficial on* YOUNG *as it is on* OLD *meadow*. Plants, like animals, if stinted or half starved when young, seldom acquire great vigor or luxuriance afterwards; the organs of nutrition become adapted to the early supply of food, and cannot be readily enlarged, on its being increased in advanced age. Hence the advantage of employing rich soils for nurseries—of keeping *young* farm stock well—and of applying manures to *young* grass. A gentleman top-dressed some grass lands at one, two, and three years old, and he found the benefit to the first, double what it was the second, and treble that shown by the third. The hint is one of some importance to husbandry, and we hope it will be improved upon. The rule does hold good in regard to animals.—*Cultivator.*

From the Genesee Farmer.

SKINLESS OATS.

Two years since I sent to Albany and obtained a small quantity of skinless oats. I sowed them in the spring, and the yield equalled my expectations, but I observed there were more smut heads among them than I had been accustomed to see in common oats. I had enough this season to sow an acre, and they were got in early considering the season, and on a promising piece of ground, as I wished to give them a fair chance. Though much injured by the heavy rains that fell soon after they were sown, they grew very well, but when they came to ear out, it seemed as if they were two-thirds at least smut, and such they appeared at cutting. I have not threshed them yet, but the quantity of *oats* cannot be large. A neighbor of mine, who obtained some the same year, assures me that his are similarly affected, the ears being a very large proportion of them smut. As they were extensively scattered over the country from Albany the same season, it would be well if the results could be communicated to the public, since if they have in general smutted as bad as those in this neighborhood, it would render the propriety of continuing their culture very doubtful, as they must be much superior indeed to the ordinary oat, to bear the liability to such an occasional drawback in the shape of smut. I hope those who have sown the skinless oat will lay before the readers of the Farmer the result of the experiment.

W. G.

RICHMOND FLOUR MARKET.

The extent of the failure of the wheat crop may be ascertained by reference to the quarterly returns of our worthy flour inspecter. By this it will be seen, that compared with the corresponding quarter of last year, there has been a falling off in the Richmond inspection, of *twenty-six thousand nine hundred and forty-four barrels!*

From July 1st, to Oct 1st,		1835	43,067
do	do	1836	16,123
Deficiency,			26,944

[*Richmond Compiler.*

From the Farmer and Gardener.

AMERICAN SYSTEM OF WINE CULTURE.

It is not with a little diffidence I essay to write a piece, headed as above, for the American public: a diffidence arising from a fear of being accounted presumptuous in attempting to strike out a plan, in a measure *new*, in one branch of American agriculture; and, what would be still worse, of finding out, perhaps, after publishing, that I had been too bold, and consequently erroneous, in some positions. A diffidence too arising from a sense of insufficiency to recommend in an able and proper manner, what, I trust, I feel impelled to attempt out of a glow of patriotism in my breast, or an ardent desire to benefit my country in a very important item of her rural economy. This diffidence is heightened by a consciousness of being an obscure individual, known as a writer only by the imperfection, perhaps, of a few fugitive pieces, occasionally appearing in the "American Farmer," and its successor.

But seeing that scarcely any writings appear faultless under a strict criticism; or, as in morals, the best men are they who have the fewest faults; so in pieces for the press they are to be esteemed the most valuable only which have the smallest number of errors, I am emboldened to adventure my little production; hoping the motive for publication, and the subject matter, and not its defects, will be chiefly regarded by all candid readers.

If the same apathy prevailed in the American public as did some years since as to the importance of the vine culture, the writer would despair of making any impression through his feeble efforts: but he is encouraged by the fact that attention is considerably awakened up among the most intelligent and enterprising American agriculturalists to the culture of the vine; and to its kindred branch the silk business; to the latter especially since the introduction into this country of the Morus Multicaulis, or new Chinese Mulberry; —a tree making this business doubly profitable in suitable latitudes. Yet it may be fearlessly asserted that should these kindred branches of American enterprise continue to advance as rapidly as the fondest anticipations of enlightened patriots predict, it will be a course of years before *millions* of money will cease to be drawn annually from the country for the articles of silk and wine.

Legislative premiums, and public associations have lately given an additional impulse to the silk business. But little of such encouragement has been given to the rearing of vineyards and wine making. Indeed less is needed. The latter business is more susceptible of being promoted by individual enterprise. The silk business has been advanced too by inventions in America rendering its manufactory more simple and expeditious. That is America has taken the lead of eastern countries in this particular.

And it may be here asked, may not America make discoveries in the grape culture, and in making of wine, that may carry her in advance of Europe in these particulars? In reply it may be asked has any imported wine been found superior to some made by Mr. Adlum, Mr. Herbemont, and others in our country?

And if I mistake not, more wine has been made from an acre in this country than in Europe. If ever informed, I do not now recollect what is considered a large product of wine from an acre in other countries. But my impression is that a thousand gallons is a yield of rare occurrence. Now not to name the large products of Mr. Adlum, and those of others, authenticated in the columns of the "American Farmer," I will mention in particular, Capt. Burlingham's case of Scuppernong vines yielding at the rate of 2000 gallons per acre; and that of Mr. Herbemont, with his Madeira, still *more*. And Mr. Longworth of Cincinnati, Ohio, made, as he informed me, more than 1600 gallons to the acre from the Isabella grape. And the case of a single vine (the Scuppernong) in the lower part of North Carolina yielding more than five barrels of wine every year, cannot we think find a parallel in any foreign land. Now in view of these facts, we ask by what system or plan of culture were these vines made to yield so surprising a product? By the European, or one for the most part peculiar to our country? By the latter, is the answer. The former would not only have prevented this yield, but as, in case of experiments often made in our land, have probably destroyed the vines. And again, by the culture of what kinds of vines were these products attained? *Native* or *exotic?* The answer is, *native* in all the cases named. Mr. Adlum, Mr. McCall, Mr. Herbemont, Mr. Longworth, and in short, I may venture to say, all who have profitably tried the wine culture to any extent in our country, concur in the opinion that foreign kinds of vines and foreign manner of culture will not do in America. But I may say on the other hand that all these join in the declaration that native kinds of grapes, cultivated in the proper manner, will invariably produce a satisfactory result, both as to table use and wine. The unforced inference from the foregoing is, that the grape culture, to prove successful in our country, must be American throughout: American in the *selection* of kinds, and American in the *system* of cultivation. As a system of *culture* is my professed object now, I shall wave for the present, or only mention incidentally a *choice selection* of kinds of grapes for American use.

By American system of grape culture, I mean one peculiar to our country, as contrasted with the one generally adopted in Europe.

The European system is briefly that of keeping the vines *humble*, or that of planting them close, and by trimming, not permitting them to attain but a few, say three or four, feet in height. Hence in all treatises on the vine culture, founded on the European plan, rules are given about trimming *rigidly*, or as might be said when applied to this country, *murderously*. And we do not use this last term unadvisedly: for the concurrent testimony of those who have tried it in America, is, that it not only proves *injurious*, but often *destroys* the vine. Let any one who may doubt consult the pages of the "American Farmer" and other standard American agricultural works.

Many Frenchmen, and we presume skilful in their own country at the vine culture, have totally failed on trial here, or in ours. Indeed, we may say that out of numerous trials made by foreigners in America at vine cultivation, none have succeeded at all, except that by a colony of Swiss at Vevay, Indiana. And they too, I believe, saved themselves from failure by deviating from foreign systems. I have lately understood from an intelligent gentleman residing in Alabama, that the legislature offered land to foreigners on condition of their cultivating one vine, at least, for every acre granted. And that in the neighborhood, or part of the country where he resided (as to other places he was not informed) a number of Frenchmen were on bounty lands, but had had no success in cultivating vines. And, as I understood, the reason was, that they rigidly followed the system of culture established in their own country.

I beg leave here to introduce a circumstance that occurred within my own knowledge, serving to illustrate this part of my subject.

Some few months since, there travelled through this neighborhood a mendicant Frenchman, asking charities for some relatives left at one of the Cape de Verd Islands—backed by a certificate, purporting to be from the captain of the ship that brought him over the Atlantic. While at a near neighbor's of mine he spied some vines, I had furnished, of luxuriant and extended growth. He immediately drew forth his knife, and cut off some near the ground, and was about thus destroying the rest, stating that their growth was contrary to all correct rules of vine cultivation.

Some men, especially those of narrow, ignorant minds, and *wedded* to old established systems, are incapable of abstracting rules from applications, and differences of times, places and circumstances in any matters. And hence self-esteemed *infallibles*, with all their annoyances in politics, in religion, and even in agriculture.

One error, as well as difficulty, in succeeding with the grape culture in our country has been that of men of capital (men best calculated to succeed if right in the method) employing foreign vine dressers to attend exclusively to the vine culture for them. The result has always been what might be expected by those truly enlightened on the subject.

Having treated negatively on the American system of vine culture, I propose in a future number, (forthcoming as soon as time and press of business permit) to treat directly on the subject in hand, and the advantages of the plan recommended.

SYDNEY WELLER.

Brinkleyville, Halifax co., *N. C.*
Sept. 23, 1836.

From the London Gardener's Magazine.

ON THE CULTIVATION OF THE PINE APPLE.

The following account of the management of a crop of 76 plants, none of which produced fruit weighing less than from two to three pounds, many much more, obtained the Banksian medal:

"In October, 1830, the suckers were taken from the parent plants, potted in small pots, and plunged in the tan at the front of the older succession plants. In February, 1831, wishing to grow them as large as possible, Mr. Warren had his succession pit, which is 21 ft. long by 9 ft. wide, filled with fresh oak leaves which he had collected the preceding winter; on the top of which he put a compost of two-thirds light hazel loam from a turfy pasture, and one third rotten hot-bed manure and leaf-mould, to the thickness of 14 inches. In this the pines were planted 14 inches apart: they grew and flourished in such a manner, that in October, 1831, Mr. Warren's usual potting time, finding the plants doing so well, he resolved to try and fruit them as they then stood, instead of potting them, as was his usual practice. He then began to withhold the watering from the two back rows till the latter part of January; afterwards water was given as usual; and in February several fruit began to appear: the watering was then withheld from the other rows for a time, in order to bring them on in succession. In order to obtain bottom heat to swell the fruit off, the two front rows of plants were taken out and potted, taking out the oak leaves to the bottom of the pit; the space thus made was filled with well-fermented horse-dung; and, covering the later with tan, the potted plants were again plunged. The horse-dung gave sufficient heat to swell off the fruit to a great size. The surface of the soil was covered with moss, which was found to be a great help in keeping the soil in a humid state, without the aid of much water."

From the London Gardener's Magazine.

ON THE EMPLOYMENT OF CATS IN THE PRESERVATION OF FRUIT FROM BIRDS.

"Robert Brook, Esq., of Melton Lodge, near Woodbridge, in Suffolk, has four or five cats, each with a collar, and light chain and swivel, about a yard long, with the large iron ring at the end. As soon as the gooseberries, currants, and raspberries begin to ripen, a small stake is driven into the ground, or bed, near the trees to be protected, leaving about a yard and a half of the stake above ground; the ring is slipped over the head of the stake, and the cat, thus tethered in sight of the trees, no birds will approach them. Cherry trees and wall-fruit trees are protected in the same manner as they successively ripen. Each cat, by way of a shed, has one of the largest sized flower-pots laid on its side, within reach of its chain, with a little hay or straw in bad weather, and her food and water placed near her.

"In confirmation of Mr. Kendall's statement, it may be added, that a wall of vines between 200 and 300 yards long, in the nursery of Mr. Kirke, at Brompton, the fruit of which in all previous seasons had been very much injured by birds, was last year completely protected in consequence of a cat having voluntarily posted himself sentry upon it."

From the United States Gazette.

BEET SUGAR.

To J. R. Chandler, Esq.—Sir: Perceiving by the many applications made to me for information respecting beet sugar, that not only a very general interest prevails on the subject, but also some very erroneous views, I take leave, through your wide circulating paper, to publish a few of my ideas thereon, being the conclusion I have come to, after numerous experiments, as well as from information I have obtained from the most scientific French authorities.

1. An establishment will not clear its expense unless it be calculated to manufacture at least from two to five hundred pounds of sugar per day, so that the idea of individuals in this country manufacturing profitably for private consumption is preposterous; their sugar would stand them, including labor, a dollar per pound.

2. The greatest advantage will be derived from steam power, which will accomplish three objects at least, viz; first, the rasping of the beets; secondly, the reducing of the liquor "in vacuo;" and thirdly, the boiling of the syrup without the risk of burning it, of which the beet syrup is in much greater danger than the cane syrup; the proof of the former being some degrees higher than that of the latter.

3. The juice of the beet decomposes in the summer in this country in less than two hours. I have known the viscid fermentation commence in twenty minutes. When this once occurs, sugar can never be obtained from it: in a large establishment in this country, it must be prevented by chemical agents.

4. Not only must the acid be neutralized, but the mucilage must be chemically coagulated, the cerate decomposed, and the malate of lime extracted, or the crystalizing will be rendered extremely difficult, if not totally impracticable in many cases, and good sugar will never be made.

5. I am persuaded the refining process can be profitably united to the manufacture of the raw sugar.

6. The profits are incredibly increased in proportion to the extensiveness of the establishment, but no one ought to engage in this business who has not *mind*, as well as a capital.

7. One half of the manufacturing expenses will be saved by a scientific arrangement of the apparatus, so as to dispense with, as much as possible, manual labor.

8. Understanding from various farmers within from ten to twenty miles of this city, that they are perfectly content with about twenty or twenty-five dollars per acre's produce, and as each acre ought to yield on an average 40,000 lbs. of beets, which will produce 2400 lbs. of sugar, I have made the following estimate. Supposing the apparatus to be capable of working only about 100 lbs. of sugar per day, it would take twenty-four days to manufacture 2400 lbs. of sugar.

EXPENSES.

One acre of beets (40,000 lbs.)	$25 00
Two men for 24 days,	48 00
Two boys for do.	22 00
Fire and rent, &c.	40 00
Total,	$135 00

RECEIPTS.

Quantity of sugar from the acre of beets, would be 2400 lbs. which at ten cents per lb. would be	$240 00
Beet cake and molasses, &c.	20 00
Total,	$260 00
Expenses,	135 00
Profits,	$125 00

By this general statement it will be perceived that there will be nearly cent. per cent. profit; but then the interest of the capital sunk in the purchase of machinery is not included. On the other hand, the two men could work twice or four times as much, and the apparatus for the increased quantity cost very little more.

If you think these remarks worth publishing, you are welcome to them, and I am, sir, your very obedient servant.

W. W. SLEIGH.

Hamilton Village, corner of Cedar Lane.
September, 30, 1836.

ECONOMICAL METHOD OF KEEPING HORSES.

By Henry Sully, M. D.

Having received innumerable letters from gentlemen who keep horses, requesting a description of my plan of feeding, I shall save much trouble both to others as well as myself, by laying my system before the public. Having pursued the plan above 17 years, I am enabled to appreciate its full value, and, being perfectly satisfied of its superior excellence, I hope to continue the same as long as I keep horses.

Most people who know me will allow, that horses in my employ enjoy no sinecure places, and few people can boast of their cattle being in better working condition or more capable of laborious undertakings than mine.

The loft above my stable contains the machinery for cutting chaff and grinding corn. From this loft each horse has a tunnel of communication with the manger below, and a tub annexed to each tunnel in the loft for mixing the ingredients composing the provender.

There should be no rack in the stable, because this may tempt the groom to fill it with hay, and thus by overloading the horses' stomach, endanger his wind, to say little of its expense and waste, for it is a well known fact, that if a horse has his rack constantly replenished with hay, he consumes and spoils upwards of 30 lbs. per day.

The manger with which the tunnel communicates should have cross-bars, of firm oak, placed at the distance of ten or twelve inches from each other, to prevent the horse from wasting his provender in search of the grain it contains, and this space between the cross-bars, allows the horse plenty of room to take his food.

The chaff cutter I make use of, is manufactured by Mr. Wilmott, a very ingenious mechanic, who resides about five miles from Taunton, on the road to Wiveliscombe. He also provides corn bruisers, of the best construction, and any person keeping three or four horses, will save the prime cost of his machinery the first year of its trial, and the horses themselves, thus fed, to use the language of horse keepers, will always be above their work.

When the provender is thoroughly mixed in the tub, previously weighing out each ingredient, the mixture should be given in small quantities at a time, many times a day; and at night, enough is thrown into the tunnel to last till morning. This process will be found of very little trouble to the groom, who will only have to go into the loft six or eight times a day. As the component parts of the provender are weighed separately for each horse, we are certain he has his just proportion; and I have hereunto annexed my scale of feeding in four classes, for it sometimes happens that some of the ingredients cannot be procured, and at other times that it may be better to substitute others; but, whatever grain is given, it should always be bruised or coarsely ground, and carefully weighed out; for by weight alone, is it possible to judge of the quantity of farinaceous substances the horse consumes; it being well known that a peck of oats varies from seven to twelve pounds; consequently if the provender were mixed by measure there would be frequently an uncertainty as to quantity. Wheat varies from 16 to 12; Barley, from 13 to 16; Peas, from 17 to 15; Beans, from 17 to 15 per peck. And as wheat, beans, peas, barley, and oats, are equally good, and of very trifling difference in price when their specific gravity is taken into consideration, I am equally indifferent which grain I use, but I should always prefer boiled or steamed potatoes for hard working horses, to be a component ingredient, whenever they can be procured.

As I call all ground or bruised grain of whatever description, *farina*, it will be so distinguished in the following

SCALE.

	Class 1	Class 2	Class 3	Class 4
Farina, consisting of bruised or ground peas wheat, barley, or oats,	5 lbs.	5 lbs.	10 lbs.	5 lbs.
Bran, fine or coarse pollard,	—	—	—	7 lbs.
Boiled or steamed potatoes mashed in a tub with a wooden bruiser,	5 lbs.	5 lbs.	—	—
Fresh grain,	6 lbs.	—	—	—
Hay cut into chaff	7 lbs.	8 lbs.	10 lbs.	8 lbs.
Straw, &c. in chaff,	7 lbs.	10 lbs.	10 lbs.	8 lbs.
Malt dust, or ground oil cake,	—	2 lbs	—	2 lbs.
Salt,	2 oz.	2 oz.	2 oz.	2 oz.

By the above scale it will be seen, that each horse has his 30 lbs. of provender in 24 hours, which, I maintain, is full as much as he can eat. The two ounces of salt will be found to be an excellent stimulus to the horse's stomach, and should, on no account, be omitted. When a horse returns from labor, perhaps the groom will see the propriety of feeding him from his tub more largely, in order that he may be the sooner satisfied and lie down to rest.

Whenever oat straw can be procured, it is generally preferred; and some like to have it cut into chaff without thrashing out the oats; but this is a bad plan, for in preparing a quantity of this chaff, unequal proportions of oats will be found in each lot, so that one horse will have too large a portion, whilst others have less than they ought, although the portions are accurately weighed.

The only certain method, then, is, to let the grain, of whatever description, be weighed separately from its straw, and the keeper of cattle will soon satisfy himself that his cattle are in want of nothing in the feeding line. Many people object to potatoes, and think them unfit for working horses; but, from many years' experience, I am enabled to recommend them as a constituent part of the 30 lbs., and am convinced, that it is as wholesome and nutritious a food as can be procured for laboring horses, which are called upon sudden emergencies to perform great tasks, as has been abundantly proved by Mr. Curwen, M. P., who kept above one hundred horses on potatoes and straw, and always found that their labors were conducted better on this than any other food. —See Curwen's Agricultural Hints, published 1809.

Wiveliscombe, Somerset, Sept. 12, 1836.

From the Farmer and Gardener.

INTERESTING TO SILK RAISERS.

The subscriber last spring planted a small field with the Morus Multicaulis, or new Chinese Mulberry, raised from cuttings of one bud each, say about three inches long, and observing that the trees had grown much larger than he expected, and had also thrown out many side branches, and that the growth was, in every particular, so much larger than was anticipated, he thought a plain statement of facts relative to them, and their culture, might prove encouraging to silk growers, and acceptable to the subscribers of the Farmer and Gardener. He invited his friend E. P. Roberts to ride over to the nursery to see and assist in weighing some of said trees, which he did on the 1st inst. and in his presence three trees were taken up and weighed, the weight of which was 6 3-8 pounds, the average height above ground was 6¼ feet. On measuring a square rood, where those trees grew, the subscriber counted 84 trees, all 5 feet high and upwards. On separating the leaves from the above three trees, the produce was 2¼ lbs: now if we say 2¼ lbs for every three trees, as a portion of them were of a smaller size than those weighed, it will give to each square rood 63 lbs. or per acre, 10,080 pounds of leaves the first season from cuttings—and a large portion of these leaves were produced in time for raising the second crop of worms. The land on which this crop of trees was raised, is a mellow loam on a clay bottom, from which in 1835 it was estimated that I cut two tons of hay to the acre, and was manured last spring with about 22 horse cart loads of barn-yard manure to the acre. Planted in rows 4 feet apart, and 9 inches in the row.

ROBERT SINCLAIR.

Remarks by the Editor of the Farmer & Gardener.

We were delighted at the luxuriant growth of the *Morus Multicaulis* plants mentioned in the communication of friend Sinclair, as well as with their very great yield of foliage. It has satisfied us that much of the objection, which has heretofore rested in the minds of those who would reap ere they have sown, against the mulberry culture, may be obviated, if the *Morus Multicaulis* be selected for the orchard. All the calculations in our *Manual* are based upon the supposition that the mulberry trees should be four years old before they are *picked*—and in all candor we must confess that we are still of the opinion, that they ought to grow that long before they are deprived of their foliage; for we conceive that defoliation at an earlier period would tend to shorten the life of the plant. But those who are desirous of reaping all themselves, and leaving nothing for posterity, may, if they please, reap the fruits of their labor in the mulberry culture even from the first year upwards—and now let us see what the product of an acre of ground planted in Morus Multicaulis trees one year old, equal in quality with those of friend Sinclair, would yield.

He fixes the quantity of leaves at 10,080 lbs. and as 1,000 lbs. will feed 20,000 silk worms during their working season, so will 10,080 lbs. feed 201,600 worms; and as 3,000 worms will make a pound of silk, so will the aggregate number make 67 1-5 lbs. of silk, which at $4 per pound, will bring $283 40—the expense of attending an acre in the silk culture, according to our computation, is $154 20; this being taken from the *gross* amount leaves $129 20 as the profit on an acre the first year;—and we fain would ask—what can be put in an acre that will yield so handsome a profit?

The estimated expense of attending an acre in the mulberry and silk culture, as assumed by us, we have always considered large, and think so still; but we purposely made it so, in order that we might, in its *excess*, cover all possible contingencies. From some little experience of the last year, we sincerely believe that the expense of gathering leaves and feeding the worms might be lessened at least 33⅓ per cent. by judicious management, and we are certain that in proportion to the extent of an establishment would the expense be reduced.

From the Chicago (Illinois) American.

THE WESTERN "BARRENS."

Barrens are a species of country of a mixed character, uniting forest and prairie. They are covered with scattering oaks, rough and stunted in their appearance, interspersed with patches of hazel, brushwood, and tough grass. They appear to be the result of the contest which the fire is periodically continuing with the timber. The appearance of this description of country led the early settlers of the state to suppose that the scantiness of timber was owing to the poverty of the soil; and hence the title, thus ignorantly given, and calculated to convey erroneous notions to our eastern farmers, became of universal application to this extensive tract of country. It is ascertained, however, that these *barrens* embrace as productive a soil as can be found in the state—healthy—more rolling than the prairies, and abounding with that important requisite to desirable farms, good springs. The fire visits these barrens in the fall, but owing to the insufficiency of the fuel, is not able to destroy, entirely, the timber. The farmer may settle, without hesitation or fear, in any part of this species of land, where he can find timber sufficient for his present purposes and wants, for the soil is supposed to be better adapted to all the interests of agriculture, and the vicissitudes of the season, than the deeper and richer mould of bottom and prairie land. Where the fire is prevented from the ravages, (as it easily can be by the occupant of the soil,) heavy timber springs up with a rapidity which would be incredible to the northern emigrant. High insulated *bluffs*, of a conical form, and exhibiting the appearance of connected ridges, rise up from the bottoms along the rivers which meander and fertilize them; they are from one to three hundred feet in height. *Knobs* of land, stony, and often rocky, at their summits, are found along the rivers, in some sections of the state, separated by deep ravines. The prairies are often intersected by ravines leading down to the streams. Deep sink holes, which serve to drain off the waters, are found in some parts, and prove that the substance is secondary limestone, abounding in subterraneous cavities. Very little that is denominated in the eastern states *stony* ground is found in this state. There are quarries of stone in the bluffs, in the banks of the streams, and in the ravines. In the vicinity of Juliet, and many other promising villages, an abundance of stone can be procured, admirably adapted to the purposes of building, uniting durability with great beauty and warmth. *Timber*, were it *equally* distributed in this state, would be adequate to the necessities of the settlers. Its apparent scarcity, where the prairie prevails, is not to be so great an obstacle to settlement as has been generally imagined. Substitutes have been found for many of the purposes to which timber is generally applied: and the rapidity with which prairie, under the hand of care and cultivation, becomes converted into forest of timber, affords a sure guaranty for the future.

The kinds of timber most abundant in the state are oaks of the various species, black and white walnut, ash of the several varieties, elm, sugar maple, honey locust, hackberry, linden, hickory, cotton-wood, pecan, mulberry, buck-eye, sycamore, cherry, box, elder, sassafras, and persimmon. In the southern and eastern parts of the state, yellow poplar and beech may be found. Near the Ohio are cypress trees, and in several counties clumps of yellow pine and cedar. On the Calumet, near the south end of Lake Michigan, is a forest of small pine. The underwood growth consists principally of redbud, pawpaw, sumach, plum, crab-apple, grape-vine, dog-wood, spice bush, greenbrier, hazel, etc. The trees in this state are very luxuriant in their growth, and are frequently found of a stupenduous size, particularly the cotton-wood and sycamore, on the alluvial soil of the rivers.

Extract from the Farmer's Magazine, of September, 1836.

ANECDOTE OF A NOTED POINTER. A POINTER SOW.

* * * * *

A sportsman ought never to lend a pointer, since a dog, whatever his good qualities may be, will not serve a stranger either so willingly or so well, as his master, and returns home all the worse for the indiscreet experiment. However, a friend being very importunate, the owner of the pointers whose portraits accompany the present number, after some hesitation, agreed to accommodate him with Bob [a pointer] who was well advanced in life, had seen an abundance of game fall before him, and was a finished adept at his business. The gentleman prepared for the field, and the dog, perceiving the shooting jacket, gun, &c. accompanied him without hesitation. In about two hours the dog was observed, at the distance of several fields, returning home very leisurely and very unconcernedly—and home he came, followed in some fifteen or twenty minutes by the gentleman. It was easy to guess what had occurred. The gentleman had not killed a bird; but on repeatedly missing, the dog began to testify symptoms of uneasiness and dissatisfaction; and, at length, after some half-score shots had been wasted, Bob unceremoniously gave up and returned home. The lender was prepared for such a result. He was aware his friend was a very indifferent shot; and as the the dog had been in the habit of observing the game fall when the gun fired, he concluded Bob would suspend his exertions when he found them unavailing.

We have already observed, that any dog which will hunt may be taught to set. We once saw an animal bred between the water spaniel and the shepherd's dog that pointed partridges as steadily as possible. Indeed, it would appear as if this manœuvre, or act of pointing, depending as it does on the sense of smell, is not exactly confined to the dog tribe, as the following anecdote will render manifest; which, however, we should not introduce, were not its authenticity placed beyond all doubt. A *black sow*, belonging to Richard Toomer, acquired the knack of pointing. Slut was bred in the New Forest, Hampshire, and was of that sort of hog which maintain themselves upon the wild productions of the Forest, except when they have young, when they require extra food for a few weeks. She was given, when about three months old, by Thomas to his brother, Richard Toomer (both keepers in the Forest) for the purpose of breeding. Little notice was taken of her till she was about eighteen months old, as she had not produced any young: she was seldom seen near the lodge, but chanced to be observed one day near that place, when Thomas Toomer happened to be there. The brothers were concerned together in breaking pointers and setters, some of their own breeding, and others which were sent from different gentlemen; of the latter although they would stand and back, many were so indifferent that they would neither hunt, nor express any satisfaction when birds were killed and placed before them. The slackness in these dogs first suggested the idea, that by the same method any other animal might be taught to stand, and do as well as one of those huntless and inactive pointers. At this instant the sow passed by, and was remarked as being extremely handsome. R. Toomer threw her a piece or two of oatmeal roll, for which she appeared grateful, and approached very near; from that time they determined to make a sporting pig of her. The first step was to give her a name, and that of Slut (given in consequence of having soiled herself in a bog) she acknowledged in the course of the day, and never afterwards forgot. Within a fortnight, she would find and point partridges and rabbits, and her training was much forwarded by the abundance of both which were found near the lodge. She daily improved, and in a few weeks would retrieve birds that had run, as well as the best pointer; nay, her nose was superior to any pointer they ever possessed, and no men in England had better. They hunted principally on the moors and heaths. Slut has stood partridges, black game, pheasants, snipes, and rabbits, in the same day, but was never known to point a hare. She was seldom taken, by choice, more than a mile or two from the lodge, but has frequently joined them when out with their pointers, and continued with them several hours. She has sometimes stood a jack-snipe when all the pointers had passed it. She would back the dogs when they pointed; but the dogs refused to back her until spoke to, these dogs being trained to make a general halt when the word was given, whether any dog pointed or not; so that she has been frequently standing in the midst of a field of pointers. In consequence of the dogs not liking to hunt when she was with them, (for they dropped their sterns and showed symptoms of jealousy,) she did not very often accompany them, except for the novelty, or when she accidentally joined them in the Forest. The pace was mostly a trot; and she was seldom known to gallop, except when called to go out shooting: upon which occasion, she would come off the forest home, at full stretch (for she was never shut up, but to prevent being out of the sound of the call or whistle, when a party of gentlemen had appointed to see her out next day, and which she obeyed as readily as a dog,) and be as much elated as a dog upon being shown the game. She always expressed great pleasure when game, either dead or alive, was shown to her. She has frequently stood a single partridge at forty yards distance, her nose in a direct line to the bird; after standing some considerable time, she would drop, still keeping her nose in a direct line for the game, and would continue in that position until the game moved. If it took wing she would come up to the place and put her nose down two or three times; but, if a bird ran off, she would get up, go to the place, and draw slowly after it; when the bird stopped, she would stand it as before. The Toomers lived about seven miles apart, at Rhinefield and Broomey Lodges; Slut has many times gone by herself from one lodge to the other, as if to solicit the gratification of being taken out with the gun. She was about five years old when her master died, and at the sale of his pointers, &c. she was purchased by Sir H. Mildmay, and sent to Dogmersfield Park, where she remained some years: she was last in the possession of Colonel Sikes, was then ten years old, and had become fat and sluggish, but would point game as well as before. When killed, which was at Bassilden House, Slut weighed seven hundred pounds: we envy not the feelings of a man who could order the slaughter of such an animal.

From the Chronicle.

RAILWAY TRANSPORTATION OF LIVE STOCK.

One of the causes of general agricultural depression has been the want to the farmer of the means of transporting his produce with rapidity and certainty, to those districts where larger and better remunerating prices can be obtained than in his own immediate vicinity. It is well known that, though extensive purchases of fat cattle are made every year, in Herefordshire and the neighboring counties, for the London market, many are deterred from entering into the trade by the expense, trouble and difficulty, as well as certain loss, entailed in bring beasts to London, the loss being always set down at 10 per cent.; sometimes it is even much more. The consequence is, that the spirit of enterprise is checked, and the farmer loses the advantages of competition in the purchase of his cattle, and is often obliged to put up with prices that do not repay his expenses. Wherever railways have been established, they have been the means of removing this drawback upon agriculture. If railways are allowed in some parts of the country, they must be established in all; if not, a monopoly would be enjoyed by the agriculturists in the railway districts; thus the farmers near the Birmingham railway will, until other trunks projected for grazing counties are completed, enjoy the privilege of sending their cattle to the London markets in a few hours, to the exclusion of the other farmers, from want of facility of communication.

In order, therefore, to meet the demands of the farmers of Herefordshire, and to enable them to forward their produce to the metropolis in twelve or thirteen hours, which is precisely the number of days at present required, a railway has been planned and surveyed, which will connect the town of Gloucester, now the centre from which several important trunks radiate, with Hereford, passing through Newent, Dimock, and Ledbury, thus bringing railways from the metropolis into the very heart of this fertile and rich county.

From the Genesee Farmer.

ORCHARD GRASS AND THE YELLOW BIRD.

A person who is fond of nature's music and her "winged flowers," cannot do better than to sow a quantity of the orchard grass for the accommodation of the cheerful and beautiful yellow bird. From the time that its seeds are fairly out of the blow until they are fallen off or devoured, a patch of this grass will be frequented by these little birds in troops, singing and eating alternately from "morn till dewy eve." In getting the seed it displays a tact quite amusing, lighting on the tall stems of the grass, it gently sways them down, and generally some of the heads in this process of settling will come within reach. Should none be convenient for picking from, it will draw one of the head to it, as it sits perched on the stem, and holding it with one of its feet, finish the seed at its leisure. So fond is this bird of the orchard grass, that where a person has but a small quantity, and is anxious to save it for seed, it will be necessary to cut it as soon as the seed is sufficiently matured for growing, which will be when the stalk and head become partially dried, and brown.

G.

From the Genesee Farmer.

CURING CLOVER BY COCKING.

I have this year given the new mode of curing clover for hay as fair a trial as circumstances would admit, and it has perfectly succeeded. I had a piece of about three acres, from which I last year took barley and spring wheat, and seeded down with clover and timothy for mowing. It grew very thick and heavy, (by the by, Mr. Editor, it was the same piece of ground for the treatment of which I received, a year or two since, such a gentle reprimand from an English correspondent of the Montreal Herald,) lodged early, and I cut it the first of my mowing. The weather was good at the time of cutting, and before night, the work of each day was put up in cocks of from 80 to 120 lbs. weight. It was of course free from all external moisture, and considerably wilted. It stood in the cocks nearly a week without being disturbed—did not heat except in a trifling degree, and when it was opened for the final drying, it was as bright and fresh as hay need to be. It resembled plants dried in the shade, every leaf and blossom remaining entire, and few or none falling off, as is usually the case with clover cured in the ordinary way. During the whole time the cocks stood in the field the weather was fine, with the exception of one heavy shower, which gave them a thorough wetting. Whether they would have come out as well had the weather been constantly wet, may be considered questionable. As it was, it was decidedly the finest lot of clover hay I ever saw put in a barn, and shall for the future use the method of cocking in preference to any other. There were about ten tons on the land mowed, a tolerable crop for the first cutting after seeding.

W. G.

From the Floricultural Cabinet.

ON THN CULTURE OF THE TULIP.

By W. J. P.

As I emerged from the dawn of my admiration of flowers, the tulip formed a prominent feature, and each successive bloom strengthened and confirmed my devotion to the cultivation of that lovely flower, not forgetting the carnation, pink, ranunculus, auricula, &c., which may justly rank among the "beauties of the creation."

Numerous inquiries having been made upon the subject, I am induced to make the following detailed observations on its culture, conceiving that it may be instructive and acceptable to those who ardently admire the flower—are doubtlessly wholly or nearly unacquainted with the general treatment and nature of the plant, and are desirous of obtaining information on the subject.

Soil.—The standard of soil for the tulip should indisputably be a strong, rich yellow loam, laid open and exposed, previous to using, to the action of sun and air, for at least one winter and one summer, turned over every few weeks, by which means it becomes thoroughly decomposed and divested of all acrid and rank qualities, and in a state congenial to the natural order of the vegetation of the plant.

Manure.—There is upon this point some little difference of opinion, even amongst the oldest and most scientific growers of the present day; but it is, I believe, admitted by a very considerable majority of the most inveterate fanciers, that the intermixture of manure upon the undermentioned principle is decidedly beneficial, and is acted upon with the utmost success. It should be equal proportions of horse and cow dung, laid up in a heap for at least eighteen months, turned about once a month, but in frosty weather more frequently, in order to allow the frost well to penetrate it, as it must not on any account be applied to the tulip bed until it has become completely pulverized, and formed positively into a substance as fine as mould, when it is entirely freed from every pernicious or injurious property, and the existence of insects is nearly or wholly annihilated. Then the application of one-third part of such manure to two-third parts of loam as above described, will —I speak from the most certain results of experience and adoption—be found highly beneficial in producing a fine full green foliage, a strong upright stem, and a vigorous and perfect bloom.

The bed—should be about 4 feet wide, of a length proportionate to the quantity required to be planted, varying from 12 to 15 feet in length, planting seven in a row, the outer root to be about 3 inches from the edge. The box, as it is termed, to be composed of strong wood, not less than one inch and a quarter thick, and is raised 10 or 12 inches from the surface of the ground, below which the soil should be completely removed for at least one foot, filling up about one-half of the space so dug out with some rather large cinder ashes, or clinkers, or brick rubbish, or any substance which will not adhere closely, in order to admit of a good drainage under the bed; then over that fill up the remaining space upon a level with the regular surface, or bottom edge of the boarding or box of the bed, with a good dry mellow loam, which has been exposed some months to the air; and then proceed to fill the box with the composition above described, it being first well mixed and united together, to within about an inch of the edge on each side, and raised gradually from each side towards the centre, so that the middle row will be some inches higher in the ground than the outside rows, although planted the same depth, being careful to plant the largest and tallest growing roots in the centre, and the next size in proportion in each of the other three rows, the smallest or shortest being outside. Round my bed, when thus arranged, I put a neat, lightly constructed, open green fence, made of one foot single laths, not too close together, and painted green, so that it stands just one foot high above the upper edge of the box of the bed, gives a neat, finished and ornamental appearance to the bed, and forms a material protection to the growth and bloom of the plants. When the tulip stage is then erected over, and properly covered in the blooming season, the bed assumes a regular and handsome appearance, and forms no inconsiderable scene of attraction.

Planting.—The time to be selected for that purpose is from the latter end of October to about the 12th of November, choosing during that period the most open, dry weather, as that description of soil which is used for the growth of the tulip cannot be disturbed with facility except when at least moderately, if not nearly dry; independent of which, it must be found more inconvenient to plant (as very many persons do) a bed of several hundred roots in wet, heavy weather. I judge it, therefore, of much advantage to avail myself of the earliest time above stated, if the weather be fine.

Dibble, or dibber, as it is termed.—The best that I have ever seen or heard of is one which several friends and myself make use of, which is made of block tin, about six inches in depth, 3 inches in diameter across the top, narrowing to the bottom to about 2 inches, with a mark or piece of solder outside 4 inches upwards from the bottom. This has a strong handle projecting over the top, sufficiently circular and large to be convenient to the hand, and each extremity soldered well on the outside, near the top or upper rim of the dibble. The material advantage derivable from this dibble is at once explained and easily and quickly comprehended, inasmuch as by this method the bed (being well settled and prepared for planting, and marked out for the number of rows intended) is not at all compressed and disturbed, because by gently pressing and turning this dibble round until the mark above described reaches the surface of the bed, every hole is made the precise and equal depth (4 inches) throughout the bed, sufficiently large at top to admit of the hand to place the root regularly at the bottom; the dibble, as described, being smaller at bottom than top, retains the earth, which is quckly turned out into large garden pots, or on a bed or border close at hand; and then afterwards the roots, when in, can be covered, and the holes filled with the same soil as was taken out, raking the bed over lightly and regularly with a fine rake or spade, to settle the earth firmly and properly. This is, by all who have seen and used it, admitted to be the most perfect and convenient system. It is also an additional advantage to dib the holes a week previous to planting, by which means the soil is well exposed and sweetened, and the bulbs are afterwards less liable to the attack of insects. Previous to putting in the roots, it is a great advantage, and universally adopted by those initiated in the treatment of tulips, to put a table spoonful of "sharp sand" in the hole. This is the surest preventive of the attack of the earthworm, or any insect whatever, and preserves many a sickly or damaged bulb from rotting.

From the time the tulip is planted until the latter end of March or beginning of April, little or no attention is required, where the bed is constructed on the principle above described; but at that time, as the buds advance in growth, they are more or less susceptible of injury from frost, and particularly a superabundance of wet. With a bed of choice tulips, then, it is highly advisable, if not indispensable, that a temporary awning or covering, by means of large hoops and canvas, should be thrown occasionally over the bed, to protect it, as much as practicable, from heavy rains, hail-storms, sharp cutting north-easterly, &c. winds, and the chance of sharp frosty nights, which not unfrequently occur at this season. There are many beds, however, in which the choicest varieties are cultivated, that have no such temporary protection afforded them; but by being properly raised and drained as above described, the root is kept in a vigorous, healthy state, and the buds sustain in general but little injury from such mischances.

Bloom.—In the beginning of May, when the buds become sufficiently matured, and begin to display their various stripes and tints, it is time to prepare to place the upper or main awning over the bed, which on a regular stage is so constructed as to admit of being drawn up at pleasure by means of a roller with pulleys on each slope, so that sun and air can be admitted or excluded as occasion requires, without which convenience the bloom can never be retained so long or in so much perfection, observing always to give the advantage, if possible, of very early morning sun, until the flowers are all in full bloom, and by all means the refreshing air after sunset, if not too cold; but the flowers to be wholly protected from the weather, and particularly the operation of the sun and wind, with those exceptions. If the season has been dry, and the weather be hot, the plants when in full bloom, will probably exhibit symptoms of drooping; it will then be necessary to apply water moderately and cautiously between the rows, by means of a fine watering pot.

When the bloom is completely over, let the covering be wholly removed, be the weather what it may, and the plants fully exposed. When the foliage and stem have become sufficiently brown and withered, which will be about the 25th of June, by which time the root matures and becomes in a state of rest, take up the roots cautiously with a rounded trowel, strong, being careful not to touch or cut the bulbs; separate the largest offsets, and place them in a dry room or shed, where the air has free access constantly, but totally away from the effects of sun or fire. When the bulbs are dry and hardened, (say in about a week or ten days,) place them carefully away until the time of replanting.

The method adopted by many famous tulip bloomers, who have many hundred named roots to take care of, is to have shallow boxes or drawers, with divisions or partitions in each, only large enough to hold one root in each; they contain seven holes or divisions from front to back, and may be made any width that is fancied. These rows are numbered from one progressively, by which means the roots are placed in them in that order as they are taken from the Tulip bed. The tulips are of course planted in the precise order in which they are arranged and written down by name in the tulip book, and if any mistake or error is discovered in the course of the bloom, the book is then corrected. So the roots are taken up and disposed in these boxes agree as to order, and any alteration or variation of roots for the subsequent planting can be made at pleasure.

But as this, though a most superior and convenient plan, may be found objectionable on the ground of expense and trouble at first, (as these boxes or drawers should, to be complete, be fitted into a case or frame, after the manner of a chest of drawers, with open ribbed sides and back, and kept in an airy, dry room, away from sun, and where little or no fire is kept,) the best method that I am aware of, in the absence of some such convenience is to put the roots singly in what is termed technically "small hand" paper, one root only in a piece of paper, with the name of the tulip written on it. This is the best paper that can be procured for the purpose, being soft and pliable, and not liable to injure the shoots of the bulbs previous to planting.

Offsets—should be planted about three weeks earlier than the parent bulbs, and tolerably close in proportion to their size, with a layer of sharp sand under them, and covered about two inches with fine sifted soil.

The whole body of soil for the main bed should be first passed through a screen or coarse sieve.

I have never known or heard of tulips treated somewhat upon the above principle, with reasonble attention, that ever suffered to any material extent from insects or weather.

Form the Farmer's Series of the Library of Useful Knowledge.

ASHES, SOOT, AND SOAPERS' WASTE, AS MANURE.

Ashes of every description, including soapers' waste, though not all falling strictly under the character of fossil substances, and, indeed, being partly derived from the vegetable kingdom, yet, partaking in a great degree of the same calcareous nature as those of which we have already treated, may also be allowed to rank together under the general denomination of mineral manures. Those of coal, wood, and turf, when used for domestic puposes, are, in almost all country places, mixed up by the consumers with the dunghill, and, unless they form an unusual proportion of the heap, occasion but little sensible difference in the properties of the manure; but, when applied alone, as top-dressings upon grass, they both strengthen the herbage, improve its quality, and encourage the growth of white clover: they are also generally used for many other crops, both of corn and artificial grasses, but chiefly upon clays and heavy tenacious loams.

The *ashes of coals*, and *cinders*, have, indeed, the very perceptible effect of loosening as well as stimulating those soils, and when they can be procured in sufficient large quantities, in the neighborhood of great towns and manufactories, they are also ploughed in with great advantage, to the extent of 50 or 60 bushels, or even more of the latter, per acre.

Those of wood, which forms the chief firing in the interior of this country, are also largely employed by many farmers, who contract with the cottagers for all the ashes they make; drawing home for them in return their faggots. The manure thus procured, being a powerful alkali, has a very considerable effect in correcting any acidity that may exist in the soil, but is, in almost every instance, employed without any distinction respecting the sort of timber from which it is obtained, though as the trees contain very different qualities, they necessarily yield ashes corresponding, to a certain extent at least, with their original character; and were they classed, and farmers made acquainted with their relative properties, they would be much better able to judge of the due proportion of ashes which it might be expedient to apply to the ground.*

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* It is a well-ascertained fact, that the closer the texture of the wood, and the harder and heavier it is, the greater portion of vegetable alkali it will be found to contain. Thus, by a brief analysis extracted from the Essays of the Bishop of Landaff, trees may be classed, according to the value of their ashes, as follows:—

First Class.	*Second Class.*	*Fourth Class.*
Oak	Elm	Birch
Ash	Maple	Alder
Sweet Chestnut	Hornbeam	Sycamore
Yew	Whitethorn	Poplar
Beech		Hazel
Pear	*Third Class.*	Elder
Crab	The Pine and Fir tribes	Sallow.
Blackthorn		
Broom		

A similar remark will apply to the *ashes procured from furze;* for these are found to possess different degrees of strength, in proportion as they are burned, either in the brick-kiln, the lime-kiln, or oven. Thus it is well known to most farmers that, in preparing chalk or limestone for burning, in most country kilns, these faggots are very generally used, and being placed in the centre of the pile, as the heat increases, and the stones get into a state of calcination, the action of the fire soon affects all the smaller and looser parts of the stone, which fall down to the bottom, and mix with the ashes. Inasmuch, therefore, as burnt lime possesses a greater stimulus than burnt clay, we may conclude that in the same proportion this refuse from the lime-kiln will be more valuable than that from the brick-kiln; while the ashes produced by the baker's oven must be far superior to either, and may rank in much the same class as those obtained by the burning of weeds.*

The *ashes of burnt straw* have also been found beneficial by many intelligent practical farmers, from some of whose experiments we select the following instances. Advantage was taken of a fine day to fire the stubble of an out-field soon after harvest, the precaution having been previously taken of sweeping round the boundary to prevent injury to the hedges. The operation was easily performed, by simply applying a light to windward, and it completely destroyed every weed that grew, leaving the surface completely covered with ashes; and the following crop, which was wheat, produced full five quarters per acre. This excited further experiment, the result of which was, that in the following season, the stubble having been partly ploughed in according to the common practice, and partly burned, and the land sown with wheat, the crop produced eight bushels per acre more on that portion which had been burned, than on that which had been ploughed-in. The same experiment was repeated, on different occasions, with similar results; and a following crop of oats having been laid down with seeds, the clover was found perfectly healthy, while that portion on which the burning of the stubble had been omitted, was choked with weeds.† To which we must add the experiment on the efficacy of burnt straw, as stated in p. 248 of this work, which, though not supporting the superiority of corn crops over those manured with dung, yet, on those two, in which alone it could have been supposed to have taken effect, it bore a very near degree of equality. It must, however, be recollected, that if intended to have a decided effect, the stubble must be left of a considerable length, which will occasion a material deficiency of farm-yard manure; though the advantages will be gained of saving the cost of moving the stubbs, the seeds of weeds and insects will be considerably destroyed, and the land will be left unimpeded for the operation of the plough.

On the wolds of Lincolnshire, the practice of not only burning the stubble, but even the straw of thrashed grain, has been carried, in many cases, to the extent of four to six loads per acre; and, as it is described in the Report of the County, has been attended, in all those instances, with very decidedly good effect. It is even said to have been found superior, in some comparative trials, to yard-dung, in the respective rate of five tons of straw to ten of manure! Although placing implicit faith in the results thus stated, we cannot, however, but feel stong doubts of the expediency of the practice; for we should hesitate to recommend any measure that tended to reduce the quantity of farm-yard manure—the application of which is always certain and always durable, whilst the most decided advocates for the burning of straw are compelled to admit that its effects are but transitory. Some intelligent farmers, indeed, consider the benefit to arise more from the effect of the fire in the destruction of weeds and insects than from the small quantity of ashes that are produced; and its chief value must be supposed to consist in the superior degree of cleanness which it imparts to the land.*

In this country we are accustomed to regard *turf* as the mere sods cut from the surface of marshes in dry weather, and afterwards burned as fuel, for which purpose it is, in many parts, very generally employed by the peasantry. The quality of ashes thus produced must depend, like every other kind of vegetable manure, upon the nutritive portion of the matter contained in them, and will be treated of in a future chapter, under the head of Paring and Burning; but in most parts of Scotland, and throughout the interior of Ireland, the term is applied to *peat-moss*, which is found in many districts in quantities which appear inexhaustible, and seem to consist in the accumulated remains of aquatic plants, heath, fern, and other vegetable matter, brought into a state of decomposition through the effects of stagnant water: it is indeed so retentive of moisture as to retain it in a manner similar to sponge. It exists in deep pits, from which it is dug in the summer, then cut into squares, either by the hundred, or by measure, and exposed to the sun and air until it becomes dry; but when prepared for farming purposes, upon a large scale, it is burned, either in kilns or in large heaps, expressly for manure; and the most usual mode is by means of the slow combustion chiefly of the lowest stratum of the peat, as in that part, the fibres of the matter which it contains are most decayed. It is also found in many parts of England: but the ashes in the highest repute are those made at Newbury, in Berkshire, the process of manufacturing which, as it will serve with very little variation for every kind throughout the kingdom, may be thus detailed.

The stratum of this *Newberry peat* lies at various depths, though generally at about five feet below the surface, and of the thickness of from

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It therefore necessarily follows, that where the kind of timber which has been consumed can be ascertained, the proportion of ashes to be applied per acre ought to vary accordingly; for, if six loads of the best and purest ashes from oak be sufficient, ten or twelve may not be more than equivalent to them when produced from hazel, alder, or sallow; and by the same rule, if ten or twelve loads of oak-ashes were to be sown, because it may have been the custom to use that quantity of hazel, &c. the effect might be found, in a dry season, to burn up the crop. See Malcolm's Comp. Modern Husb. vol. ii. p. 178.

* Malcolm's Comp. of Mod. Husb., vol. ii. p. 184.

† Survey of the East Riding of Yorkshire; Communications to the Board of Agric., vol. iv. p. 130.

* Survey of Lincolnshire, p. 304.

one foot to eight or nine, the ground underneath being very uneven, and mostly gravel; that which is above commonly consists of a good meadow soil. The hills at each side consist chiefly of chalk, easily dissolvable by heavy rain, which washes it off the ridges, down to the low ground, where, mixing with the floods, it is floated over the meadows, and deposited in the peat; the ashes, therefore, differ from those of most other districts, in the quantity of lime which they contain, to which their extraordinary valuable qualities have been chiefly attributed. The peat varies in color, but the blackest is reckoned the best, and the most esteemed ashes have a reddish hue; those which are pale and whitish, being of a species of earth compounded of clay, and termed 'clob,' which, though burned for manure, lies above the true peat, and is of a different and very inferior quality. This being removed, the real peat is cut, with a peculiar kind of spade, into long pieces, about 3½ inches broad every way, after which it is conveyed from the spot where it is dug, in wheelbarrows, to a short distance, where it is spread upon the ground in regular rows until it be dried by the sun and wind. It is thus cut down until the gravelly bottom is reached, if it can be sufficiently drained; but although persons are employed to pump the water, that cannot be always completely effected.

After having been thus laid to dry during about a week, the pieces are turned, and this being three or four times repeated, a small round heap is made in the middle of the place where the peat is spread, and in the centre some very dry peat is put, which being lighted, the fire communicates slowly to the rest of the parcel. When it is completely lighted, an additional quantity is put upon the heap, and this is continued till the whole is consumed, which generally occupies one or two weeks, and sometimes still longer, as quick burning is not approved of, and the rain seldom penetrates deep enough to extinguish the fire. The heaps are commonly of a circular form, and rather flat at top: at first very small, but gradually increasing, until it sometimes becomes two or three yards deep, and six or seven yards in diameter. According as the peat is more or less dry, or contains more or less essential oil, or, as it is termed, is more or less fat—according as the weather is favorable or otherwise, and in proportion as the heaps are more or less large, just so much a longer a shorter time will it take to consume. A fire regulately kept up, but burning by slow degrees, will retain more of the vegetable alkali in it than a more quick one; and in proportion to the heat of the fire, the same quantity of peat will produce more or less ashes; thus it has been stated by Mr. Malcolm that in the parish of Frimley, in Surrey, three[*] loads of dried peat, which is about the size of the usual heap, will yield from 6000 to 7000 bushels, which have been sometimes known to yield 2400 bushels of good ashes;[†] though the peat is generally so reduced in measure by combustion that the ashes seldom equal one-fourth of its original bulk. The ashes being riddled, are then conveyed away in covered carts, and put under sheds to keep them from the wet until they are wanted for the land; for if kept under cover and dry, they are infinitely more strong and active than those which have been made some time, and have been exposed to the weather; the fresher they are when used, therefore, the better. The usual time of applying them is in March and April, in the proportion of twelve to fifteen bushels per acre, according to the soil and crop, as too large a quantity would be injurious, though, on meadow land, twenty bushels are often laid with advantage; and, when not used as top-dressings, they are commonly spread at the same time as the seed is sown, though for grass many people prefer the autumn. For corn crops, however, they are not in much estimation; but on turnips they are said to assist in checking the fly, and they are supposed to increase clover nearly a ton of hay the acre beyond what it would have yielded without them: their effect, however, is not calculated to last more than a couple of years, but they are of such benefit to that crop, and to the succeeding wheat, that when a tenant quits a farm on which ashes have been laid in the preceding year, it is usually customary to allow him one-half of the expense. The price, at Newbury wharf, varies according to quality; but the best is generally sold at about sevenpence per bushel. One man, with a double cart, can sow several acres in a day, but the weather should be perfectly calm, or they will be unequally dispersed by the wind.[*]

In a series of experiments, for a long time carried on upon these ashes they were found to contain from one-fourth to one-third part of gypsum and even a larger proportion of that substance was discovered in some burned in the neighborhood of Stockbridge, in Hampshire. The other constituent parts consisted of a little iron and common salt, with various quantities of aluminous, calcareous, and siliceous earth;[†] and the analysis of some very celebrated peat-ashes, brought some years ago from Holland, in which country and Flanders they are most extensively used as manure, as made by Professor Brande, showed them to contain, in 100 parts,

Of Siliceous earth, - -	32	parts,
Sulphate and muriate of soda,	6	„
Sulphate of lime, - -	12	„
Carbonate of do. - -	40	„
Oxide of iron, - -	3	„
Impurities and loss, - -	7	„

from which we may readily conclude the great degree of advantage with which they must be applied to sour meadows, as well as to every species of artificial grass.

The *Dutch ashes*, indeed, as we learn both from Sir John Sinclair's account of the agriculture of the Netherlands, and from another statement lately published regarding their use,[‡] are very extensively used throughout Flanders, in the following manner:—

In March the wheat is worked with the hoe between the rows, and sown with clover, and in May the wheat is hand-weeded. The crop being reaped, the land is harrowed in the following spring, and the ashes are spread by hand upon the clover, in calm and hazy weather, at the rate of 18 to 20 bushels per imperial acre. They are also laid on pastures and on wheat in March and April; on oats and beans in the beginning of May; and on rye in October and November. Their chief employment is, however, for green crops: it having been found, on comparative trials in Flanders, that top-dressings on clover, where the ashes were used, were much earlier, heavier, and superior in every respect, to those which had undergone a top-dressing of horse and cow dung. One of the best proofs of their usefulness, indeed, is the fact, that while our crops of clover in this country very often fail, such an instance but rarely occurs wherever they are use in any part of Holland. Besides improving the crop, they are also useful in preventing the injuries arising from insects, and when applied to pasture they are highly serviceable in the destruction of moss. To numerous individual instances of their beneficial effect, Sir John Sinclair, indeed, adds the public declaration of eighty-three practical Flemish farmers, to the effect that 'they know by experience, that when clover is not manured with Dutch ashes, at the rate of 25 cuvelles per hectare (equal to 19 bushels per acre,) the following crop is very bad, notwithstanding any culture that can be given to the soil; whereas they always have an excellent crop of wheat after clover, and, doubtless, in proportion to the quantity of manure abovementioned being used.'* The farmers who have subscribed this declaration must have been deeply impressed with the importance of these ashes; for, besides being brought through the canals from Holland, they must in most cases have been afterwards carried from forty to fifty miles by land carriage. They can be imported from Rotterdam, and have been delivered at Leith at £3 per ton, including all charges; the bushel of the best sort, which are black and heavy, weighs about 40 pounds, and the ton containing 56 bushels, the cost, at the above rate of manuring, will be 20s. per acre.

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[*] So in the original. Ed. Far. Reg.

[†] Agriculture of Surrey, &c., vol. ii. p. 193.

[*] Surveys of Berkshire, p. 359, and Appendix, No. 111; Hertfordshire, p. 166 and of Middlesex, 2nd ed. p. 368.

[†] Sir H. Davy's Elem. of Agric. Chemistry, p. 298.

[‡] Mitchell on Dutch Ashes as Manure. Quart. Journ. of Agric., No. xxi.

Soot.

The soot produced by different species of fuel is subject to the same difference in quality as those substances from which it is derived. Thus the pit-coal brought from Sunderland and Newcastle contains a much larger quantity of bitumen than that which is found in Staffordshire and most other parts of the interior, which burns to a white ash and exhales a considerable portion of sulphur; while that of the various kinds of wood and peat, when burned, also manifest a proportionate variety of properties. It would, however, be nearly fruitless to enter into any detail of its peculiar efficacy, both as not being of sufficient importance, and as having been ascertained by the following very minute experiment personally made by Mr. Malcolm, which speaks more effectually to a farmer than all the chemical definitions that can be offered; though it may be observed that the result coincided precisely with a very scrupulous analysis.*

The experiment was made on a piece of drilled wheat, of the extent of half a quarter of an acre, sown upon a potato-fallow well manured for that crop, and afterwards dug with the spade about 18 inches deep, and marked into beds of 5 feet wide; four rows being sown very thin in drills made with the hoe at one foot distance, and only 2 quarts of seed being used to each bed. It was not sown until the 14th of December, and, from the lateness of the season, none of it vegetated before the frost set in; but as soon after Christmas as that was gone off it made its appearance very regularly, and on the 22nd of February every bed was carefully hoed, each being numbered, and top-dressed as follows:—

No. 1, with soot from coals.	The quantity of soot applied to each being 1 bushel.
2, do. from wood.	
3, do. from peat and turf.	
4, do. from coals.	Do. half a bushel.
5, do. from wood.	
6, do. from peat and turf.	

The usual course of management was pursued until harvest, when the whole crop was in admirable order, but the first three numbers were in height nearly a foot above the rest, stronger in proportion, free from blight or mildew, and produced a finer grain. The amount was as follows:—

				bl.	pk.	qt.
No. 1	-	-	-	1	3	6
2	-	-	-	1	1	4
3	-	-	-	1	2	5
4	-	-	-	0	3	7
5	-	-	-	0	3	3
6	-	-	-	0	3	0

The entire crop was thus at the rate of 5½ quarters per acre; but the soot was accurately collected from fires burnt in the house, while that commonly sold by the chimney-sweepers is in general mixed with dust and other trash, which lessens its power: their measure, too, is generally short, it being concluded by the dealers that the soot is taken at once to the field, without being remeasured; but the fraud is worth guarding against, for, although it varies greatly in price, it is not usually to be obtained in London for less than from sixpence to sevenpence-half-penny per bushel, strike measure; while at York, it is now five; at Hull, four; and at Manchester, only two shillings† per bushel, corn measure, and it has been recommended to be spread in the following proportions:—

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* Two other very eminent farmers state, 'that no manure, though it were to be given in greater quantities, and at more expense, would equal it in strength. That he sows it at the rate above-mentioned, and always obtains two great crops of clover, besides pasturage afterwards; and that wheat after clover, manured with Dutch ashes is the most certain crop of any, as well as being unmolested by the wire-worm.' They have also been recommended by an eminent agriculturist, F. L. W. Brakkel, in a work lately published at Utrecht, his alternation of crops being clover, potatoes, rape-seed, peas, wheat, clover, and oats.

* Mr. Malcolm,s experiment was extended to other kinds of top-dressings, consisting of brick and lime rubbish, with mixens of dung, road-scrapings, and other substances, an account of which he has stated, and which were found inferior to the soot.—See his Comp. of Mod. Husb., vol. ii. pp. 167, and 157 to 169.

† So in original. Ed.

Upon strong loams—	
For wheat	from 40 to 45 bush.
Seeds and pasture	20 to 30
Upon light loams—	
For wheat, barley, and turnips	30 to 35
Seeds and pasture	20 to 25
Upon chalky loams—	
For wheat, barley, and turnips	30 to 40
Seeds and pasture	20 to 25

but the latter is, upon all soils, the more common quantity.

When labor is at 12s. a week, the price of sowing is generally one-half-penny the bushel, sometimes with beer; and at this rate an active man has been known to earn from 3s. to 4s. per day, sowing from 70 to 80 bushels, and upwards. The soot being previously brought in sacks, the sower fills his scuttle, and scatters the dust by putting his hand fully expanded into it, and spreads it—generally walking backwards—as wide as possible. The operation is however more generally performed by chimney-sweepers than by the farmer's people; for, let the air be ever so still—which is, indeed, the only proper time in which to spread it—the lighter particles will hang in the air, and settle about the sower in a manner that will not only soon make him as black as itself, but, entering his eyes, nose, and ears, causes extreme pain through its causticity. Those who are not accustomed to it should, therefore, cover their face with a piece of gauze, as if they were working among hot lime.

Soot is usually sown upon wheat if it be weak, or if the yellow cast which it sometimes assumes in the spring shows it to be sickly; in which cases it will improve the color and strength of the plant, which will then tiller out and cover the ground with a great number of new shoots. Upon barley it is sometimes sown with the crop, and other times a fortnight after; but it should never be deferred later, and if possible, should be spread in April. It is also occasionally applied as a top-dressing to clover and other artificial grasses, though it seems better suited to rye-grass than to any other species, for, when both that and clover have been sown together, and that the field has been dressed with soot, the former has become so rank as to completely overtop the latter. One of its most common uses among farmers is, however, for turnips, either sown along with the seed, or, more usually, immediately after the plants appear, as it is so acrid and bitter as to become injurious or disgusting to insects, and has therefore been found very efficacious in preventing the ravages of of the fly, as well as that of the wireworm. The best time to sow it is on the evening of a cloudy but calm day, when there is an appearance of rain; for if the weather be hot and dry, its volatile parts are dispelled, and it becomes of no service to the crop.

Some farmers recommend its being mixed with an equal quantity of quick-lime, and double that quantity (of those two combined) of fresh loam; the soot and loam to be regularly amalgamated by passing the latter through an upright screen, as practised by bricklayers, by which means the lumps will be either kept back, or broken and passed through it; and after remaining in this state during almost a fortnight, the lime should then be added by turning the heap and mixing all together; after which it will, in a few weeks more, become fit for use. The materials thus enumerated are all good, and doubtless will prove serviceable to those soils to which they are adapted; but we are not sufficiently acquainted with the experiments which have been made upon this species of compost to speak of its effects with any degree of certainty; and we doubt whether the most beneficial mode of applying the soot will not be still found to consist in spreading it in a dry state, without any preparation, as a top-dressing. As an application in that mode, to such crops as we have mentioned, it will be found useful, when used in moderation, upon soils of every kind; but if intended to be applied as an improvement to the land, it will be of very little benefit after the first year.

Soapers' Waste.

The use of the ashes produced by the manufacture of soap—the refuse of which is termed *soapers' waste*—has been much recommended as manure; and it has been supposed that its efficacy depends on the proportion of saline matter which it contains: this, however, is very minute, and depends upon the sort of alkali employed by the soap-boiler, two kinds of which are chiefly used namely, kelp and barilla—which are much more effective than that which is the refuse of common pot ash. These substances are both derived from the calcination of marine plants, of which the sea furnishes an abundance in a peculiar nature of weed, particularly on the western coasts of Scotland and Ireland, where many thousands of the poor inhabitants obtain their chief support from securing and burning the former. The species known as barilla is, however, chiefly procured from the island of Teneriffe and some parts of the Mediterranean; the difference between the two, in 100 parts, having been shown, by the analysis of Sir Humphry Davy, to be as follows:—

Barilla.

Carbonate of lime	76	Total of calcareous matter exclusive of gypsum	91
Quick lime	15		
Gypsum			6
Common salt			1⅓
Carbonate of soda			1¼

Kelp.

Calcareous matter, such as that for barilla	94
Gypsum	3
Soluble saline matter and carbonate of soda of nearly the same proportion.	

The alkali contained in kelp, however, often differs from 1 to 6 per cent.; but the manufacture has been almost entirely abandoned since the late duty on barilla imported from abroad has been recently taken off, and as it is not probable that it will be renewed in this country for the mere purposes of manure, the latter is the only quality that need be considered.*

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* On the deplorable condition to which a numerous class of our peasantry has been reduced through this act of the legislature, it is not our intention to offer any remark; but we may suggest, that it becomes a matter so much importance to ascertain whether the

The other ingredients in the common kinds of soap are lime, with oil or tallow; but as the oily particles are wholly extracted in the manufacture, the waste can only be considered as a calcareous manure, and consequently will be only found efficacious on such soils as are deficient in that substance, or in those which abound largely in undecomposed vegetable matter, upon which it acts powerfully. It must, however, be observed that the waste from hard and soft soap is materially different in its qualities, for there is a greater proportion of alkaline matter in the manufacture of the former than that of the latter: thus, in examining the ashes that are produced from soft soap, they will be found light and spongy, which may probably arise from potash being used in its composition, instead of barilla; while the refuse of hard soap is more dense and firm, and much stronger than the other in its effects upon the ground. Farmers should therefore inquire, before they use it, which sort is made by manufacturer, and use it accordingly.

On strong, cold, and wet soils, or low spongy meadows overrun with rushes and similar weeds, as well as on peat-moss and other land that is rank with vegetation, it is found highly beneficial; on loams it is also an admirable manure, and in any rainy season its effects are quickly visible, for its hot nature is probably tempered by the moisture: but its application is not advisable on calcareous soils, or on light, dry, and burning sands, and it is generally thought preferable to lay it upon pasture than upon arable ground. When laid upon the latter, however, it should be harrowed in previously to the sowing of the seed; or if ploughed into the land, the ashes being of a very heavy nature, the soil should be turned in with a shallow furrow, and should be spread in as fresh a state as possible, as they have been found to lose a considerable portion of their strength when long exposed to the atmosphere. It has been laid in various proportions, from 60 to 240 bushels per acre, between the effects of which it is not easy to discriminate, both from the difficulty which we have just stated of correctly ascertaining its strength, and from the variety of soils to which it is applied, which circumstances must necessarily occasion a diversity of practice; but when consisting of that species of waste arising from hard soap, it may be safely employed in the following quantities:—

On strong arable land	from 200	to	240	bushels.
loams, for wheat	160	„	200	„
do. for barley and turnips	120	„	160	„
pasture, generally	160	„	200	„

It has been generally found most serviceable no wet lands; and if employed on light soils, or in very dry weather, great caution should be used, or its heating quality willl have a very prejudicial effect upon the following crop. Upon grass it has even been laid, according to the account of a plain practical farmer, who has used it during upwards of twelve years, to the enormous extent of *forty tons per acre*, without any mixture, and fresh as it came from the vat.* He says—to use his own expressions—'that, when mixed up with earth, he found it to be only doing things by halves. It was thought that the quantity would burn up the land, which was only of fair quality; but from the moment of the application, the sward took a shade of darker greeen, and it has since never produced less than two tons an acre of hay, and has carried a heavy stock of New Leicester sheep. It has been also laid by Mr. Billingsley upon some very coarse meadow, in the quantity of six wagon-loads per acre, with very extraordinary effect; the rushes immediately disappeared, and gave place to a luxuriant crop of trefoil, which was so obvious that the eye could trace the line of separation during three or four years afterwards. The application of 160 bushels per acre, once in five years, is also said to have more than doubled the product; and in strong, wet, and heavy land, under poor pasture, in the neighboorhood, of Epping, four wagon-loads per acre, have effected a total change.†

The price is now merely nominal; it was formerly, in most great towns, about 10s. for the wagon-load drawn by four horses, for it is never regularly measured by the soap boilers; but the demand has so far ceased, since the late depreciation of agricultural produce, that the great London manufacturers are now glad to disembarrass themselves of the waste by which they are encumbered by giving it gratis to any person who will take it off their premises.

The best method of using this manure has been thought by many persons to be that of a compost with dung and earth. So far as the earth is concerned, there can be no objection to the practice; but in regard to the dung it may admit of doubt, for, in proportion to the quantity of alkaline matter left in the ashes, the duration of the effect of the dung will be lessened, much in the same manner as by a mixture of quick-lime. If, however, such a compound is determined upon, the dung should be first well fermented, then mixed with at least four times its quantity of maiden earth, and afterwards duly incorporated with the same quantity of ashes as of dung, when the heap should be carefully turned over. By this means the acrimony of the ashes will be effectually corrected, and the compost may be used upon tender loams with better effect than if employed alone.

The following account, among numerous other instances, of an experiment on its effects in equal proportions upon a crop of potatoes, is extracted from a report‡ drawn up by order of the Board of Agriculture:—

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kelp thus formerly employed may not be still usefully applied as manure. Some reports presented to the Holland Society would lead to that conclusion: 30 tons of sea-ware are required to produce 1 ton of kelp, which is said to have equal power upon the land as the weed in its wet state. The manufacture of a ton of kelp has, indeed, been calculated to amount to £3 15s.; while the weed can be cut, carried on shore, and dried, for about 25s. to 30s.; but when in the latter state it is only applicable to the ground at a short distance; and when manufactured it is as portable as any species of ashes. It is also probable that the proprietors of the kelp shores and the manufacturers may find it expedient to lower their rate of charges, so as to render it available to the use of farmers.

* In the Lancashire Survey it is likewise said, that "about Liverpool they commonly put on from 40 to 50 tons per acre," p. 506.

† Essex Report, vol. p, 246. See also the Report of the N. R. of Yorkshire; and the Papers of the Bath Society, vol. i. p. 129.

No. 1	No manure	produce	134 lbs.
2	Stable-dung and soap-ashes	„	298
3	Stable-dung alone	„	315
4	Soap-ashes alone	„	383

To which it must, however, be added, that four wagon-loads per acre have been laid upon twelve acres of a clayey loam, somewhat brushy and soft of heart, which being sown with wheat, no difference could be perceived between that and the crop in another part of the same field:* but it should also be observed, that its power upon the subsequent crops has not been stated.

If applied in large quantities to the land, there can be no doubt that soapers' waste will be found to be a useful and a lasting manure; it destroys slugs and vermin of every description; has been found to increase the product of hay by a ton an acre; and by some farmers, the effect of a wagon-load of the ashes is considered equal to that of five loads of rotten dung. This we, however, conceive to be exaggerated, if they are applied separately; but, if laid on together, we have witnessed some recent instances which lead us to conclude, that one load of ashes, combined with five of dung, would fully equal ten loads of farm-yard manure in immediate effect, besides producing more permanent improvement.

If laid on in the shape of compost, the mixture of earth, if taken from land of a different quality from that to which it is to applied, will doubtless have an additional effect on the improvement of the soil; but if used sparingly, it will, in either case, be hardly felt. In districts where lime is to be procured in abundance, it is not much sought after, as it is looked upon as possessing nearly the same properties; though, according to its analysis, that idea is not altogether well founded, for, although the quantity of alkaline salt and gypsum which it contains is but small, they yet render it superior to common calcareous matter as a top-dressing for every kind of grass. The expense of conveyance is also another objection to its general use; but in the neighborhood of large manufacturing towns, in which it can be easily procured, and to which farmers have constant occasions to send their teams, it can there be obtained with no further charge than that of back-carriage.†

COAL DEPOSITES NEAR FARMVILLE.

To the Editor of the Farmers' Register.

Farmville, October 22, 1836.

At a time when the whole country is so much interested on the subject of railways, it may not be improper, to trouble you once more, in relation to the coal deposites in this neighborhood. I feel the more excusable for this, inasmuch as, in my previous communications, I have expressed so much doubt with regard to the existence of coal in large quantities. I am happy now to state, that my doubts are nearly removed, and that I think I have good reason to believe, that we have in this vicinity, a coal-field of incalculable value. Should this opinion prove correct, much importance will be added to the construction of rail-roads through this place; more especially, if the rumor be true, that there is considerable failure in some of the Chesterfield coal mines, as to the quantity of coal yielded.

I went on an excursion, a few days ago, with a party of gentlemen, with a view of inquiring for and examining the indications of coal in the neighborhood. On the Bizarre lands, belonging to the estate of the late Richard Randolph, we found a place in which there were several veins of dead coal on the surface, with large strata of shale intervening; and in an adjacent ravine, where there had been a little digging, we found the veins of coal much increased, and those of shale greatly diminished. Among the dead coal here, there were many lumps of good coal. The whole company supposed, that at this spot, there was afforded the promise of a most valuable deposite of coal, if the veins continue to approximate as rapidly below as on the sides of the ravine. This spot is on the river cliff, and very near the river.

We also found on the lands of Mr. James Anderson two other strata, both of which, we thought, afforded undoubted prospects of great value. One of these was in a ditch about three feet wide at bottom; the stratum extended across the ditch, and longitudinally with the ditch about ten or twelve feet. The ditch was cut from east to west, and nearly all the strata in the neighborhood have their course from north-east to south-west. I mention these circumstances, because we failed in meeting the labor and implements which we expected—and, with a poor grubbing hoe and our own poorer personal labor, we were unable to ascertain the size and dip of the vein. This inability, however, would augur favorably, as I have always been able very speedily to ascertain these matters with small veins. With regard to the size of this vein, there was some diversity of opinion. All concurred in the opinion, that it would be well worth working. My own opinion is, that it must be, at least, six feet through, for I have never seen in the whole field any vein of coal not running north-east and south-west, and whose dip was not either to north-west or south-east. The quality of the coal was also better than I have ever seen so near the surface. This place is about four miles from Farmville and a little more than one from the Appomattox.

We have recently learned that there are promising out-runnings of coal in other places, which we will, as soon as practicable, visit, and report to you, if we think them worthy of notice.

W. S. MORTON.

INQUIRY AS TO GREEN SAND.—REMARKABLE PRODUCT OF SWEET POTATOES.

To the Editor of the Farmers' Register.

Barren Hill, Nottoway, Va., Oct. 13, 1836.

I herewith send you a sample of earth, which I apprehend to be the same as the "green sand, or Jersey Marl," so often spoken of in the Register. It is found in quantity in the bed of a deep ditch which was cut to drain a natural pond of long standing. The surface of the bed is composed of a crust, a quarter of an inch thick, of a red color, which, I suppose, is produced by the action of the air on the iron particles (formerly the oxide or protoxide). Within this crust, the sand is of a deep green color, interspersed with shining particles; which, however, upon exposure to the air, readily forms a crust of a red color.

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* Communications to the Board of Agriculture, vol. vi. art. 39.

† See the Essex Survey, Sect. Soapers' Ashes; Adam's Essays on Agriculture, vol. i. p. 167; and a Treatise drawn up by the order of the Board of Agriculture upon Soapers' Waste, in the Communications to the Board, vol. vi. art. 39.

My attention was drawn to it about eighteen months ago, by seeing some remarks on green sand in your paper. In September, 1835, I selected some samples to carry with me to the Commencement at Hampden Sidney, to show to Dr. Dame, the Professor of Chemistry; but forgot to take them along. On mentioning my intention to him, he observed that he had just received from you samples of shell marl and green sand, which he showed me. I thought that the latter was exactly like my earth. I afterwards sent more supposed green sand to him, to compare and ascertain its identity, but it miscarried; and now I know no other chance, than that of applying to you, to get you to take upon yourself the same trouble. I am well aware that your multiplied engagements must necessarily leave you very little leisure to attend to inquiries of this sort, yet I venture to solicit it, upon the consideration of the utility of such a discovery to the agricultural interests of the country adjacent.

While I am writing, I will add, that I have just finished digging my sweet potatoes. The product was greater than is usual to obtain in this neighborhood. From three bushels planted on about a quarter of an acre, I obtained 70 heaped bushels, after having used them for three weeks before they were dug. They grew on land that was cleared and planted in corn last year, and manured with stable dung this spring, previous to making the hills for the potatoes. They were ploughed once and hilled twice. I attribute my success to the quantity of seed used for the space, there being two or three times as many put in each hill as is usual. The vines grew more luxuriantly than any I ever saw before. They were nearly knee deep over the whole area. As they were not killed by frost, and were much relished by cattle and hogs, I have stored them away for winter forage. But several to whom I mentioned this intention, tell me they will kill cattle; either by poisoning them, or causing them to swell. I should like to know from yourself or correspondents if there is any truth in this statement; as otherwise those who grow them on a large scale, might make a very desirable addition to their winter stock of provision for cattle, by taking them from the hills before they were killed by frost.

Some eight or ten days after the usual time of planting potatoes, a neighbor gave me ten or twelve red potatoes, which he thought highly of, about the size and length of a finger. These I placed in a flower box, in rich mould, and set it at the south side of the house, in a warm place. They soon sent forth a dense mass of sprouts over the whole area of the box, which I drew, and planted four or five in a hill, in a moist season. The produce from the sprouts that first came up, was two bushels of fine large potatoes. They continued to send forth sprouts for some time, which I gave away, or neglected to transplant.

From this small experiment I am induced to believe, that when seed potatoes are scarce, by treating them in this or a similar way, a small quantity would plant as much land as a large one does in the common way, and forward the crop a week or two.

Should this, or any part of the foregoing communication be deemed worthy a place in the Register, you may insert it, or dispose of it as you think fit.

S. CARTER.

[Owing to having mislaid the sample of earth referred to above, it is regretted that no opinion can be offered thereon at this time: but were it otherwise, such expression of opinion would be worth very little. Our general opinions as to the value of green sand, or rather as to the uncertainty of its effects, have been already stated. We confess our ignorance of what constitutes its value as a manure—and have not yet seen any evidence that any others are much more enlightened in this respect. We have made many and large experiments with this earth, and sometimes with much success and profit—but the results have been generally unfavorable and unprofitable, and are strongly contradictory to the received opinions as to this manure being generally useful—and also of its rarely beneficial effects being attributable to the potash contained. We are far from wishing to discourage investigation on this interesting and still mysterious subject: on the contrary, we earnestly desire the increased attention of men of science. But we *do* desire to repress the general eagerness for this particular substance, which, like the mania for gold mining, causes far more valuable and certain resources to be contemned and neglected.

As to the means of detecting green sand in any earth where its presence is suspected, it is as much at the command of every inquirer as at ours. As directed more fully by Professor W. B. Rogers, (in his interesting communication to Vol. II. Farm. Reg., and also in Appendix to *Essay on Calcareous Manures,*) it is only necessary to separate a few grains of the earth on a card, or on firm white paper, and mash them thereon with the moistened point of a knife: if any green sand is present, it will be indicated by the green color marked on the paper. As to the proportion, the examiner must judge by the appearance of the mass or sample—unless he can resort to a chemical process requiring much care and trouble, and far more knowledge than we pretend to, even if in such a case as this, the object deserved it. After the presence of green sand is proven by the simple process above stated, we advise that the earth be tried as manure on the soil, as the only way (in the present state of ignorance on the subject,) of knowing whether the earth is worth any thing.]

For the Farmer's Register.

ON SUCCESSIVE CROPS OF CORN ON THE SAME LAND.

A nameless writer in the last number asks, "who has cultivated the same land in corn for ten years, and what were the comparative crops?"

As this county affords numerous instances of a successively continued corn crop, for a length of time far greater than I have heard of in other places, I think I may venture to answer the interrogatory. The land in this county, when first settled, like the lands generally of lower Virginia, was subjected to the culture of tobacco. After the population had increased so as to require a large supply of bread stuff for home consumption, and the price of tobacco having declined, it became necessary to abandon tobacco and cultivate corn.

There are in this county, small tracts of land which have been in corn, year after year, as far back as the recollection of our oldest inhabitants extend. The same fields have been planted in corn successively for more than half a century, and now at the present time, strange to tell, produce a pretty good crop. These lands when new, (judging by the contiguous cleared lands of recent cultivation,) produced from three to five barrels of corn per acre. Now, at this day, although they have been under a corn crop annually for more than fifty years, they yield from two to three barrels to the acre, with the application of a very small, meager scattering of manure; and where a tolerably liberal manuring has been given, as much corn will be produced as when the land was first cleared.

These facts would lead to many speculations, which, if I had leisure, I might be disposed to indulge in. It is considered by all agriculturalists, that vegetable matter is very essential in a soil to produce any kind of crop. Here we have instances of land producing pretty good crops of corn with no vegetable matter in the soil. It is impossible there can be any such matter, as the corn is well worked, by plough and hoes, and all grass which may vegetate, speedily destroyed. If perchance, a little crab grass should show itself after the corn is laid by, the cattle are turned in when the corn is gathered, and thus that little is destroyed; so that, from year to year, the land is kept clear and naked. Where then do the stalks get their substance from? The atmosphere!! But they contain lime and gypsum. Where do they come from? There is none in the soil—as that consists of simple sand and clay. I will not undertake to solve these interrogatories, but leave them for others to unravel.

There is perhaps, little or no soil in any other portion of this state, which would bear such a continued corn crop without greater deterioration. Most soils would, by such a course, be reduced to absolute sterility. How then does it happen, that this land will sustain such severe cropping? Is it the character of the soil? Or is it the contiguity to salt water? It must, I conceive, be the former; as there are lands equally under the influence of the salt water, which will not sustain a corn crop for so long a period without being reduced to the lowest degree of productiveness. There are within my own observation, even in this county, lands which have, by this continued cultivation of corn, been reduced so low as to produce scarcely any corn at all. These lands are more sandy, indeed they have little or no clay in their composition. From these facts I am led to the conclusion, that the lands which have sustained a corn crop so long, have been enabled to do so, by having a soil composed of a happy admixture of sand and clay, aided by a perfectly level surface, which prevents their washing.

WM. SHULTICE.

Mathews Co., Va.

[Lest our silence should be construed into concurrence (as has happened heretofore,) we must express dissent from some of the deductions of our correspondent. The remarkable durability, or long continued productiveness, of some of the soils of lower Virginia, is a fact as certain in itself, as it is good proof of their value and good chemical constitution. But however strange, however unaccountable, may be their continued productiveness under such treatment—however great the abstractions of vegetable matter, and however small the returns—it is nevertheless certain that some vegetable (or other putrescent) matter must still remain, or that the soil would be perfectly barren. The ashes of any growth on this land (as intimated above) would also be found to contain lime, in one or several of its combinations: but this (if standing alone) would prove that lime *was* in the soil—though probably not there in the usual form of *carbonate* of lime—and possibly not as either the sulphate (gypsum) or as phosphate of lime. We here can merely express dissent: for extended views on this subject, we refer to the reasoning on the doctrine of *neutral and acid soils*, as stated at length in the Essay on Calcareous Manures.]

To the Editor of the Farmers' Register.

Bremo, Oct. 18, 1836.

It may be satisfactory to your intelligent and interesting correspondent, Doct. Muse, and perhaps to other inquirers on the subject, to know, that his observations on the propagation of the Hessian Fly, are sustained by the concurrent testimony of one other practical observer. I therefore send you the following extract from the American Farmer, Vol. 1, page 296.

JOHN H. COCKE, sen.

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Proceedings of the Agricultural Society of Albemarle.

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Papers communicated for publication by the Corresponding Committee.

ON HESSIAN FLY.—READ NOV. 1, 1817.

Bremo, October. 1817

Sir:—Believing the following facts to be new in the natural history of the Hessian Fly, I deem them worthy to be communicated to the society:

1st. That this destructive insect deposites its eggs on the blades of the wheat indifferently, at from half an inch to three inches from the main stalk, or central shoot.

2d. That they remain upon the blade, in the egg state, from 5 to 7 days at least:

And 3d. That they are hatched into the worm or maggot, on the blade.

That the egg is deposited on the leaf, or blade of the wheat, is discoverable by close examination to the naked eye; but may be put out of all dispute, to the dullest sight, by the aid of a magnifying glass. The upper surface of a blade of wheat, is formed into alternate ridges and furrows, running longitudinally, and the eggs are so sunk in the furrows, that they will not be disturbed by drawing the blade through the fingers and thumb under considerable pressure. The shape of the egg is cylindrical, rounded at the ends, and at first, in color and appearance, resembles a piece of amber, but as it approaches to hatching, assumes a redder cast. On the 9th Oct. I first discovered the eggs on a piece of lawler or fly-proof wheat, which had been sown as early as the 22d of September. The plants at that time, generally had three leaves, and there seemed to be a manifest preference in the flies to place their eggs on the second or middle blade, but they were found indiscriminately scattered upon the surface of this leaf, from half an inch to three inches from its point of contact with the central shoot. In several instances as many as forty eggs were counted by the aid of a glass on a single blade.

Particular eggs which were identified from day to day until they hatched, were found to remain upon the leaf, the shortest period of time, five days, the longest seven. How long they had been deposited when first discovered is uncertain, but it is presumed, some days, as the flies appeared in numbers, out of all proportion, small to the vast number of eggs. In two instances only, were the eggs discovered at the instant of their being laid by the flies, and in both of these cases the plants were destroyed in removing them to the house, to subject them to close examination: and thus the attempt was defeated to fix the period more definitely, that the egg remains exposed on the leaf.

As soon as the eggs hatch, the worms commence their journey down the blade, to its point of contact with the main stalk, which it envelopes to the union of the boot and stalk at the crown of the plant. Some of the worms were detected in the act of moving down the blade; but for the most part, after the disappearance of the eggs from the blade, by stripping down the boot, the worms were found in a state so minute, as scarcely to be discoverable to the naked eye, lodged near the root, just at that part of the plant which is the seat of all their mischief; and where they are found in the subsequent chrysalis state.

When they have once placed themselves in this situation, they are clearly beyond the reach of all remedies. But the fact being established, that they remain from five to seven days at least, on the blades of the wheat, seems to hold out some prospect, that means may be resorted to, that will at least diminish, if not entirely destroy them.

May it not be an experiment worth trying, to watch the progress of the flies, and as soon as they are found to have deposited their eggs, to graze the crop closely? There are many difficulties which present themselves, to carry this suggestion into practice upon a large scale, but against so great an evil, a partial remedy is better than none. If successful, possibly it may be found capable of extension sufficient for the object.

Publications have already appeared, stating the exemption of grazed wheat from the wide spread depredations of the fly last spring—but my knowledge of the insect at that time, not extending farther than the chrysalis, a state in which they are so manifestly inaccessible to any remedy that would not extirpate the plant, my mind naturally referred the effect to some other cause. Now it is clearly to be comprehended that this destructive insect may have been devoured in the egg state, with the leaves of the wheat.

JOHN H. COCKE.

PETER MINOR

Secretary of the Agricultural Society of Albemarle.

From the Alexandria Gazette.

WAR WITH THE BEES.

Our quiet neighbors at West End, were on Tuesday put in no little commotion by the singular and unexpected breaking out of a war in their territories, which raged with great fury for several hours, and whilst it lasted was destructive to man and beast. We have to enumerate one *killed!* many wounded, and multitudes put to flight.

It seems that the bees in a gentleman's garden became enraged at the near approach to their hives of two horses and carts which were backed up for the purpose of unloading wood. They sallied out at once, and attacked with vigor the horses and drivers. In a few minutes the drivers were put to flight, but the horses not being able to disengage themselves, had to bear the brunt of the onset as they best could, and that was but feebly indeed. One of the poor animals was stung so severely that he actually died in a short time, and the other was rescued by the servants wrapping themselves in blankets and going with determination to his assistance. This accomplished, all hands, we believe, precipitately retired from the vengeance of the winged warriors.

The bees, finding that their enemies had "ingloriously fled" from the field of battle, resolved to carry the "war into Africa." Mustering their forces, they invaded the village, scattering themselves abroad, stinging pigs, dogs, and cows, and chasing men, women and children. They absolutely held entire possession of the enemies' country for some time, driving back several pedlers who attempted to cross the Stone Bridge with their wagons.

The approach of night put an end to the contest, but the justice of history compels us to say, after a calm review of the events of the whole day, that considering all the facts and circumstances, the bees had decidedly "the best of the battle."

From the Lancaster Express.

LIABILITIES OF THOSE WHO TAKE NEWSPAPERS AND PERIODICAL PUBLICATIONS.

The laws declare that any person to whom a periodical is sent, is responsible for the payment if he receives the paper or makes use of it, if he has never subscribed for it, or has ordered it to be stopped. His duty in such case is not to take the paper out of the office, or to tell the person with whom the papers are left, or the publisher, that he does not wish for it. If papers are left in a post office or store, tavern or other place of deposite, and are not taken by the persons to whom they are sent, the postmaster, store, or tavern-keeper, &c. is responsible for the payment, until he returns the paper, or gives notice to the publisher that they are lying dead in the office. Such being the facts in the case, it is a query whether publishers of periodicals are faithful to the government and the laws, when they allow so many frauds to be practised on them without notice. Can there not be some mutual understanding on this subject?

The following is extracted from the "Instructions to Post Masters."—"In every instance in which newspapers, that come to your office, are not taken out by the person to whom they are sent, you will give immediate notice to the publisher, adding the reason, if known, why the paper is not taken out."

Extracts from the Journal of the Franklin Institute.

LIST OF PATENTS ISSUED IN FEBRUARY, 1836, FOR IMPROVEMENTS OF MACHINES, &c. TO BE USED IN AGRICULTURE, OR DOMESTIC ECONOMY.

With remarks, by the Editor of the Journal of the Franklin Institute.

For a *Machine for hulling Clover Seed;* John B. and William F. Poague, Lexington, Rockbridge county, Virginia, February 17.

A conical stone is to revolve in a corresponding hollow cone of the same material. The mode of fixing, driving, &c., are all quite antique; and the claim is to the "before described machine;" which claim may be perfectly correct, if by the "before described machine," we are to understand a machine which has been repeatedly before described.

For an improvement in the *Manufacture of Starch;* Walter and Thomas Leveredge, Dorchester, Norfolk county, Massachusetts, February 17.

"We claim a patent for manufacturing starch from rice, or for the application of rice as a substitute for other substances heretofore used in the manufacture of starch." Whether so broad a claim as this can be sustained, is a very doubtful point. Rice is the principal food of a large portion of the human race, and is, by millions, eaten to the exclusion of nearly every thing else, and that among a people who use starch largely in their manufacturies; we have not at hand, or in memory, any direct information on the subject, but the probabilities are much against the absolute novelty of the manufacture.

The process followed by the patentees, but not claimed, is the following: fifty pounds chloride of lime are dissolved in one hundred gallons of water, and to the liquid when drawn off clear, eight pounds of sulphuric acid are added. Upon any quantity of rice as much of this liquor is to be poured as will just cover it, and it is to remain, with occasional stirring, for forty-eight hours. The liquid is then to be drawn off, and the rice ground, with water, to about the consistence of cream. To every one hundred gallons of this liquid, as much water is to be added, after which it is to be strained through a bolting cloth, to be allowed to settle for twenty-four hours, the clear liquid drawn off, and the starch dried.

We do not understand the chemistry of this proceeding, the first step of which is to make, and to destroy, a solution of chloride of lime.

For a *Machine for Sawing Staves;* Aaron Bard and Simeon Heywood, Lunenburg, Worcester county, Massachusetts. First patented July 8th, 1834. Patent surrendered, and re-issued February 20.

We noticed this patent at page 93, Vol. xv, and mentioned the existence of a previous one for the same thing. The patent has been surrendered for the purpose of claiming those particular things in which the present patentees view their improvements as consisting; namely, "the manner of running the saw on friction wheels, lapped by each other; also the flanch, or flanches, to keep the saw from running off its bearings; also the slide boxes for the axles of the friction wheels to run in and set them to the saw."

The saw is a complete hoop, which was included in the patent of Sumner King, noticed in Vol. xiii, page 121, and believed to be new; if this opinion was correct, it is presumed that the present patentees have acquired a right to it, without which their improvements would be of no value.

For a *Machine for Thrashing out Clover, and other small seeds;* James Cooper, Greene county, Ohio, February 20.

A cylinder is to be made of wood, armed with strips of iron, which are to rub the seeds against a concave placed under it; the concave is to consist of straw, broom-corn, or other fibrous substances placed endwise in a box, and compressed firmly together, the surface of which must, of course, be cut into such a form as will adapt it to the cylinder. The claim is to "the mode described of making the concave, or bed, of straw, broom-corn, split wood, bristles, split whale bone, or of other similar materials; also the mode of ironing the cylinder."

For a *Winnowing Machine;* David Wilson, Johnson, Franklin county, Vermont, February 20.

This is denominated a *horizontal* winnowing machine, and it receives this name, we suppose, from the fan being made to revolve horizontally, to do which, its shaft is acted on by bevel gear. This appears to be the only thing about it which stands a chance of being called new, and even this, it seems, was, correctly, accounted unworthy a claim, which extends only to "the arrangement and adaptation of the several parts of the before described horizontal winnowing machine."

For *Sawing by Lever Power;* Jeremiah Walker, Philips, Somerset county, Maine, February 25.

A pulley on a double crank shaft is connected by a strap or band to another carrying a circular saw. The two cranks on the first shaft are in opposite directions, and each of them is connected by a pitman to a horizontal lever under the frame work, so that these levers may work up and down like treadles: one of these levers is made long, and is to be worked up and down by hand, the other is short, and is loaded with a weight at its vibrating end; as the long lever is forced down the weight is raised, and as the long lever is raised, the other, with its weight, descends. This constitutes the whole affair, and he who does not pronounce the contrivance for continuing the power, greatly inferior to that of the ordinary fly wheel, knows but little of machinery.

For a *Cooking Stove;* Billy Titus, of Marshall, Oneida county, and Anson Titus, of Phelps, Ontario county, New York, February 25.

The claims made are to "the application of a tin or sheet iron baker or cover, for the purpose of baking or cooking on the movable hearth, in the manner specified, and the application of a box stove of very small size, and in its simplest and cheapest shape, to cooking, as described." The stove and its fixtures appear to us so much like many others, that we cannot venture to tell what is meant by the foregoing claims.

For a *Vibrating Pump;* Sampson Davis, Derby, Orleans county, Vermont, February 25.

The patentee says, "what I claim as new, is a new improvement of principle in the method of raising and conveying water, by means of the *vibrating pump.* I claim no more." This new application of principles consists of a small overshot wheel, supplied with water in the usual way, and having a crank upon one end of its shaft, which is to work the piston of a small force pump. The cylinder of the pump is made to vibrate, like that of the vibrating steam engine, and the water is to be delivered through a flexible hose, admitting thereby of a free vibration.

For a *Smut Machine;* Abraham Mudge, Canajohaire, Montgomery county, New York, February 25.

"The principle which I claim to have applied to the purpose of cleaning grain from smut and other impure substances, by means of the machine above described, and which application I claim to have invented, is that of throwing the grain by means of wings, or flanches, attached to a circular plate as above described, against some hard substance with sufficient force to break smut balls &c."

This apparatus appears te be very well calculated to effect the proposed object, and to blow off the dust from the smut and other sources; but the form of the claim is objectionable, as the same principle has been before applied for attaining the same end, and it is the particular method of applying the principle, alone, which is the proper subject for a claim.

For an improvement in the *Saw Mill;* David Worthington, Peru, Berkshire county, Massachusetts, February 25.

The saw used is to be furnished with teeth on each of its edges, and is to cut the stuff as the carriage travels in either direction. There are to be two rag wheels with teeth in opposite directions, and two feed hands, one for each wheel; the double toothed saw is not new, and is not claimed as such, the claim being confined to the particular arrangement adopted for moving the rag wheels; a thing in which there is no difficulty whatever, every machinist knowing methods of accomplishing this object, which no patent can prevent him from employing.

For a *Bee House;* Ebenezer Beard, New Sharon, Kennebec county, Maine, February 25.

The claim made is to "the manner of constructing and arranging the hives and boxes within the house, and the manner in which the bees communicate therewith." We have no doubt that the arrangement described, is convenient and beneficial, but we do not think that it is sufficiently distinguished, in the description, from other similar contrivances, to admit of a claim so general.

For a *machine for Washing and Pressing Clothes;* Caleb Angevine, City of New York, February 25.

The claim is to "the circular wash cask; the manner and mode of applying the steam; the dog or other animal power to the cylinder; together with the formation of the horizontal press, and also the perpendicular lever press, as described in the specification."

We cannot say much for the novelty of the individual things claimed, as will be evident from a brief description. There is a boiler with a furnace under it, and a steam pipe leading from it into a horizontal cylinder, within which the clothes are to be placed, and agitated by dashers, made to revolve by a winch, in the ordinary way. The pressing is effected by placing the clothes within a cylinder, and forcing them together by means of a piston, or follower; the application of dog power, is, we apprehend, a mere embellishment, giving some life to the affair.

For an improvement in the *Cotton Gin;* Henry Clark, Montville, New London county, Connecticut, February 25.

This improvement consists in making the iron ribs between which the saws pass, in two thicknesses, the front being of steel, and attached to the iron by screws. The claim is to "the making the ribs in two parts, so that they can be easily detached and repaired."

For a *House Warmer;* O. Kindrick, and W. Elwell, Gardiner, Maine, February 25.

A hollow box of iron is placed across the back of the fire place, with a tube from one end of it leading into a cellar, or other place, for a supply of cold air, the other end being furnished with a tube to conduct the heated air into the room; this latter tube is to pass to some distance up the chimney, where it is to be elbowed, so as to admit the heated air into the room; and the patentess say, "what we specifically claim as our improvement, and for which we ask an exclusive right, is the making of, and applying a box, cistern, or cockle, as above described, to a common fire place, fire frame, or stove, for the purpose of heating or warming rooms."

This plan is equally old and inefficient. Would it not be well to add a dog wheel, or some other motive power, to force air through the tube by means of a blowing apparatus?

FACTS IN REGARD TO THE DURATION OF LIFE, OF SLAVES AND FREE NEGROES.

A correspondent of the New York American, under the signature of "A New Englander," presents some valuable and curious statistical information, as to the mortality among whites and blacks, slaves and free, deduced from the bills of mortality of the cities of New York, Philadelphia and Balduring the years 1820, '21, '22. '23, '24, '26. The following are his calculations.

leaths among whites in New York:
n (blacks excluded) as one in 40,17
Philadelphia, 39,65
Baltimore, 39,99
acks in New York as one 19,01
adelphia, 19,52
altimore, 39,99
free blacks in Baltimore to popu-
aves and whites excluded) 1 in 32,08
among slaves, 77,68

his calculation presents some very important acts; first, the great disproportion between the deaths among the whites and blacks; and second, the still more striking difference between those of the free blacks and slaves of the city of Baltimore. It speaks volumes in favor of the care bestowed on the slaves by their masters, who it seems, have only half the chance of living which the slaves themselves have, and the mortality among the latter is only one fourth as great as among the free blacks of our own city. Indeed, in the year 1824 there was but one death to 120 of the slave population in Baltimore, and in 1825, not one in 88. 73. The average number however, for six years, is as stated above.

Again, in the county of Middlesex, Virginia, calculating for a population of 2000, there are none of the free colored people who have attained the age of 100 and upwards, while of the slaves there are 18. 7. In Princess Anne county there are 24, and in Orange 20, to the same proportion of the slave population. Throughout the United States, according to the last census, there are 14. 1 in a population of 20,000 slaves, who have reached the age of 100 and upwards, and but 1. 02 among the same number of the free. According to the reports of interments for the city of Baltimore, for the years 1831 and 1833 it appears that eight persons attained the age of 100, whereof seven were colored, whose united ages amounted to 759. It is also a fact well ascertained, that the slaves in the principal slave-holding states, double their number in something less than 28 years; while it is evident that the free colored population would actually become extinct in the course of a few years, were their number not recruited by constant accession from the slave states.

From the Silk Culturist.

FRAUDS IN THE SALE OF TREES, &C.

The great demand for trees, slips and seeds of the Morus Multicaulis and other varieties of the Chinese mulberry, and the high prices they are selling for in market, should admonish purchasers to guard against frauds and impositions in the sale of spurious articles. The intrinsic value of these varieties to practical silk-growers, and the enormous profits which nurserymen derive from their cultivation, have already created a demand altogether beyond their ability to supply, even at the most liberal prices. This fact, in connection with the strong desire which is now manifested by many enterprising farmers to engage in the business, has opened the door to unprincipled speculators to palm upon the credulous articles which are not only spurious but worthless. We have heard of no impositions of this kind in the sale of trees and slips; but we have heard of an individual, we hope not a Yankee, who is said to be travelling in the western states, and selling cabbage seed at $5 an ounce, and affirming it to be genuine Chinese mulberry seed of the first quality.

The same fraud may easily be practised upon the community in the sale of trees and slips, under the pretence of their being the Chinese mulberry. The eagerness of some men to furnish themselves, will induce them to purchase a few even at the most extravagant prices, and there are sharpers enough in the community to take advantage of it. We should not be surprised to hear that the old dealers in "wooden nutmegs" and "horn flints" had turned their attention to the manufacture of Chinese mulberry trees, &c. and that their agents and pedlers were selling them in large quantities and at high prices. It is to be hoped, that this will not be the case; but as long as there is even a possibility of it, a little vigilance will do no harm, and it may prevent purchasers from being swindled out of their money by dishonest men. We would therefore, recommend to gentlemen who are desirous of purchasing, to apply to nursery men, or regular dealers, in preference to buying of travelling agents. They are generally men of character and responsibility, and there is no danger of imposition in the character of the articles they sell. The same may be true of travelling dealers; but as long as there are but a limited number in market, there is no necessity of hawking them about the country; and we should suspect the individual who should be thus engaged. We understand, however, one or two nursery men have travelling agents; but in every instance they are furnished with proper credentials, and consequently the same confidence is to be placed in them as in their employers.

From the Silk Culturist.

MIGRATION OF FISHES.

It is a well established historical fact that the rivers of New England were originally plentifully stocked with migratory fish, particularly salmon, shad, bass and alewives. In the Connecticut, shad were so abundant that they were sold by the fishermen for two and three cents a piece, on condition however, that the purchaser took an equal amount in salmon, which were still more abundant, at the same, and sometimes at a less, valuation by the pound. In the Merrimack also, salmon were caught in such quantities as to furnish the principal part of the food of the inhabitants in its vicinity—and there is a tradition that a father, in indenting his son as an apprentice to a mechanic, insisted on an express stipulation that he should not be compelled to eat salmon more than half the time.

It is also a well known fact that for the last half century shad have been annually diminishing in these rivers, and that salmon have entirely deserted them; while in the Saco, Androscoggin, Kennebeck, Penobscot and Machias, they are caught in considerable quantities. The desertion of the salmon from the Connecticut and Merrimac, and several intermediate rivers, while they continue their annual visits to the rivers of Maine, has been a subject of much speculation, and attempts have been made to account for it in different ways. Some have supposed that the numerous bridges, mill dams, &c. which have been thrown across their head waters have prevented their ascension in the season of spawning, and diverted them to other rivers where these obstructions do not exist. Others attribute it to the contamination of the waters of their tributary streams, in consequence of being the common sewers of dye-houses, bleacheries, tanneries and work-shops employed in the prosecution of manufactures and the arts. Another class have supposed that the disturbance of the water, by the revolution of wheels used in propelling steamboats, has driven them to seek quietude in waters undisturbed by the commerce and enterprise of man.

If the cause is to be found in either of the foregoing suppositions it must be in the first, as is evident from the fact, that the effect was produced before either of the others existed. Though not absolutely certain, it is, however, more than probable that the artificial obstructions in these rivers and the numerous rivulets by which they are fed, have prevented the salmon from ascending them to deposite their spawn, and consequently rendered the race extinct. If this be true, it follows as a matter of course that these, and all other rivers, may be replenished with them, with great ease, provided the obstructions are removed, and a free passage given them.

There is no doubt that the fowls of the air and the fishes of the sea are subject to the restraining laws of nature, which keep within their own limits the whole animal creation. The great controlling law of nature—the unconquerable love of home—extends to the brute creation, and exerts as powerful an influence upon irrational as it does upon rational beings: hence migratory, as well as stationary species of fish, never wander from home voluntarily. This doctrine is supported by too many facts to be questioned. Take for instance, the codfish which inhabit the banks lying between the 41st and 45th parallels of latitude. So different and uniform are the fish taken on the different banks, that an individual conversant with them, finds no more difficulty in distinguishing between them, than a butcher does in distinguishing the flesh of a bullock from that of a swine. The states of Massachusetts, Rhode Island, Connecticut, and New York, form a continuous line on the coast, and their maratime cities are but a short distance from each other; and yet their fish markets are supplied with very different species of fish. The same is true with respect to the middle and southern states. This can be accounted for on no other supposition than they are restrained to their own waters and feeding ground, by some law of nature to which they are subjected.

It is also equally evident that migratory fish invariably return to the rivers in which they were spawned. Take for proof the fact that the shad caught in the Schuylkill are uniformly about one-third larger and of much more delicious flavor than those taken in the Delaware. The schulls ascend the bay together, separating about five miles below the city of Philadelphia, each taking its own river and in a few hours falling into the nets of the fishermen. The same is true in respect to other contiguous rivers in New England. But we are not without the light of experience on this subject. In the early settlement of the town of Hingham, bordering on Massachusetts Bay, a pond in the interior was plentifully stocked with alewives; but subsequently deserted on account of the artificial obstructions thrown across the river running from it into the bay. A knowledge of this fact, and a want of a supply of this kind of fish, induced the inhabitants of the town about a century since to make an attempt to replenish it. This was accomplished by opening fish ways through the mill dams, and conveying alewives to the pond in the season of spawning. The consequence was, the fish continued annually to increase rapidly, until it was found that the expense incurred in deepening the river, and the damage sustained by opening the mill dams more than counterbalanced the advantages derived from the fish, and of course it was abandoned. But the experiment was sufficiently tried to prove its entire practicability—for even to the present time, some of the fish make their annual return to the mouth of the river, and manifest a strong disposition to ascend.

There is, therefore, but little doubt that all rivers, having their sources in lakes, ponds or other still waters, may be stocked or replenished with salmon, and other species of fish, at comparatively trifling trouble and expense. The importance of the subject ought to ensure it a thorough examination and faithful trial.

SUGAR FROM INDIAN CORN.

M. Pallas lately presented to the Academie des Sciences of Paris, a sample of this substance, extracted from the stem of the plant, which has been found to contain nearly six per cent. of syrup boiled to forty degrees, a part of which will not crystallize before fructification; but it condenses and acquires more consistency from that period to the state of complete maturity. The most favorable time to obtain the greatest quantity of sugar is immediately after the maturity and gathering of the fruit. The litter left after the extraction of sugar is capital to feed cattle, or to make packing paper.

From the Arcana of Science.

GAS LIGHTING.

On Feb. 28, at the Royal Institution, after a brief sketch of the origin and progress of gas-illumination in London and its environs, Mr. Brande proceeded to details connected with the present state of the manufacture, illustrating the various sources of its extension and improvement. He began by adverting to the curious and complicated products resulting from the destructive distillation of pit-coal; the principal elements of which he stated to be carbon, hydrogen, oxygen, and nitrogen, in conjunction with sulphur and iron derived chiefly from pyrites; these substances, by their mutual action during the application of a heat gradually raised to redness, yield olefiant gas, carburetted hydrogen, hydrocarbonous vapors, naphtha, naphthalin, tar, carbonic acid and oxide, cyanogen, hydrocyanic and sulphocyanic acids, sulphuretted hydrogen, ammonia, and several of its salts, water, and certain other products, of which a copious table was shown, containing also a statement of the relative proportions of gas, condensible products, and coke, afforded by three varieties of coal. Models and drawings of gas apparatus were then described, especially as illustrating the different modes of setting the retorts; and the progress of the gas from them was traced through the hydraulic main, where the tar, water, and ammoniacal liquor, are chiefly deposited to the condensers, purifiers, and gasometers. Some observations were then made in reference to the uses and properties of the various products, in the following order:—

1. *Ammoniacal Liquor.* This was shown to be a complicated solution of several ammoniacal and cyanic compounds in water. It is extensively used for the production of muriate of ammonia, which is obtained by saturating it with muriatic acid, evaporating, crystalizing, carefully drying the crystalized salt, and subliming it into large leaden receivers. A beautiful specimen of this salt, prepared by Mr. Leeson, of Greenwich, and weighing 2 cwt., was exhibited. Sulphate of ammonia is also prepared from the liquor; this, in its dry, crystalline state, is mixed with carbonate of lime, and affords carbonate of ammonia, of which a large mass, prepared by Mr. Leeson, was also shown. The presence of sulphocyanic and hydrocyanic acid in the ammoniacal liquor was shown by saturating it with muriatic acid, and adding persulphate of iron; the detection of these compounds and their application to the manufacture of Prussian blue, Mr. Brande said was owing to the skill and ingenuity of Mr. Lowe. This product, therefore, of the gas manufacture, once considered as useless, yields a variety of useful and important compounds, and has opened a new field of chemical art.

2. *Tar.* This product is useful as a coarse paint, and for the purpose of paying and caulking vessels: it is also more importantly applicable as fuel in the gas-works, where, mixed with water, it is suffered to dribble into the fire; three gallons of this mixture per hour being sufficient to heat five retorts. When distilled, it yields naphtha, a highly volatile and inflammable liquid, which is occasionally burned in lamps, or used as a solvent in the manufacture of certain varnishes.

3. *Lime Liquor.* This is the mixture of lime and water, through which the gas has been passed, chiefly with a view of freeing it from carbonic acid and sulphuretted hydrogen: it is from time to time drawn from the purifiers and suffered to subside. The deposite, or thick portion, is made again into lime, or is used for luting the retort-lids; the clear portion is pumped into shallow vessels placed in the ash-pits of the retort-furnaces, where it evaporates, and tends to preserve the bars, probably by keeping them cool. Another use, however, is now made of it, as follows: Acid persulphate of iron (copperas liquor) is added to it, which throws down a green precipitate, that may itself be used as a paint, but which, digested in a solution of potash, yields a ferrocyanate of potash, sufficiently pure to throw down Prussian blue from common copperas liquor.

4. *Gas.* This specific gravity of the purified gas, and, consequently, its composition, vary considerably at different periods of the distillation; its average specific gravity, as taken from the gasometers, is 0.410; each cubic foot weighing 240 grains. After some remarks upon the manufacture of gas generally, and upon the various forms of carbon, and other products occasionally found in the retorts, Mr. Brande made some observations upon the sources of the luminosity of different gases, and on photometers; and then proceeded to details connected with the process as carried on upon the large scale by the different companies; stating that his experience was chiefly derived from the Chartered Gas Company, the officers of which had most assiduously assisted him in all inquiries connected with the subject generally, and with the particular object of the present inquiry; Mr. Lowe, and Mr. Frederick Winsor, had kindly given him access to their information; and Mr. Crossley had supplied models of gas-meters and their appendages, with much of the other apparatus upon the table. Mr. Brande estimated the number of retorts worked by the above-mentioned company at 750; and assuming them to be about one-fourth of the number employed in London, the whole amount will be 3,000 retorts, of about 15 cwt. each; so that the cast iron thus employed, to say nothing of the enormous amount in pipes and other apparatus, amounts to 2,240 tons. The total stowage for gas in the gasometers of the Chartered Company, Mr. Brande estimated at 820,000 cubic feet; or, for London, 3,280,000 cubic feet. He said, that the number of burners supplied by this company amounted to about 42,000; or, for the whole of London, to 168,000; and, estimating the consumption of each burner at five cubic feet per hour, the average *hourly* consumption of gas would amount to 840,000 cubic feet; and taking five hours per day as the average time of burning, we have 4,200,000 cubic feet of gas as the daily average consumption. Mr. Brande concluded by explaining the different checks resorted to by the companies in reference to the quantity of gas produced and consumed; and by a description of the gas-meters, pressure-gauges, tell-tales, and governors, all illustrated by a series of excellent models and apparatus. The following tables were exhibited, as furnishing data and details connected with several of the points referred to in this lecture, together with some others which we have not room for, showing the relative weights and volumes of gas, and of the consumption of atmospheric air in its combustion:—

For the total annual supply of gas to the metropolis, there are required 200,000 chaldrons of coal, yielding 2,400,000,000 cubic feet of gas; the gas weighing 75,000,000 lbs. The light thus produced is equal to 160,000,000 lbs. of mould candles, of six to the pound; the bulk of the coal is equal to 10,800,000 cubic feet, or 400,000 cubic yards; or to a cube of 222 feet in the side, or of 74 yards.

From the London Farmer's Magazine.

OF MONEY AS A MEDIUM OF EXCHANGE.

By Charles Babbage, Esq. Lucasian Professor of Mathematics in the University of Cambridge.

In the earlier stages of societies, the interchange of the few commodities required was conducted by barter; but as soon as their wants became more varied and extensive, the necessity of having some common measure of the value of all commodities—itself capable of subdivision—became apparent: thus money was introduced. In some countries shells have been employed for this purpose; but civilized nations have, by common consent, adopted the precious metals. The sovereign power has, in most countries, assumed the right of coining; or, in other words, the right of stamping with distinguishing marks, pieces of metal having certain forms and weights, and a certain degree of fineness: the marks becoming a guarantee, to the people amongst whom the money circulates, that each piece is of the required weight and quality.

The expense of manufacturing gold into coin, and that of the loss arising from wear, as well as of interest on the capital invested in it, must either be defrayed by the state, or be compensated by a small reduction in its weight, and is a far less expense to the nation than the loss of time and inconvenience which would arise from a system of exchange or barter.

These coins are liable to two inconveniences: they may be manufactured privately by individuals, of the same quality, and similarly stamped; or imitations may be made of inferior metal, or of diminished weight. The first of these inconveniences would be easily remedied by making the current value of the coin nearly equal to that of the same weight of the metal; and the second would be obviated by the caution of individuals in examining the external characters of each coin, and partly by the punishment inflicted by the state on the perpetrators of such frauds.

The subdivisions of money vary in different countries, and much time may be lost by an inconvenient system of division. The effect is felt in keeping extensive accounts, and particularly in calculating the interest on loans, or the discount upon bills of exchange. The decimal system is the best adapted to facilitate all such calculations; and it becomes an interesting question to consider whether our own currency might not be converted into one decimally divided. The great step, that of abolishing the guinea, has already been taken without any inconvenience, and but little is now required to render the change complete.

If, whenever it becomes necessary to call in the half crowns, a new coin of the value of two shillings were issued, which should be called by some name implying a unit, (a Prince, for instance,) we should have the tenth part of a sovereign. A few years after, when the public were familiar with this coin, into one hundred instead of ninety-six farthings; and it would then consist of twenty-five pence, each of which would be four per cent. less in value than the former penny. The shillings and sixpences being then withdrawn from circulation, their place might be supplied with silver coins, each worth five of the new pence, and by others of ten pence, and of two pence halfpenny; the latter coin, having a distinct name, would be the tenth part of a Prince.

The various manufactured commodities, and the various property possessed by the inhabitants of a country, all become measured by the standard thus introduced. But it must be observed that the value of gold is itself variable; and that, like all other commodities, its price depends on the extent of the demand compared by that of the supply.

As transactions multiply, and the sums to be paid become large, the actual transfer of the precious metals from one individual to another is attended with inconvenience and difficulty, and it is found more convenient to substitute written promises to pay on demand specified quantities of gold. These promises are called bank notes; and when the person or body issuing them is known to be able to fulfil the pledge, the note will circulate for a long time before it gets into the hands of any person who may wish to make use of the gold it represents. These paper representatives supply the place of a certain quantity of gold; and, being much cheaper, a large portion of the expense of a metallic circulation is saved by their employment.

As commercial transactions increase, the transfer of bank notes is, to a considerable extent, superseded by shorter processes. Banks are established, into which all moneys are paid, and out of which all payments are made, through written orders called checks, drawn by those who keep accounts with them. In a large capital, each bank receives, through its numerous customers, checks payable by every other; and if clerks were sent round to receive the amount in bank-notes due from each, it would occupy much time, and be attended with some risk and inconvenience.

Clearing House.—In London this is avoided, by making all checks paid in to bankers pass through what is technically called "*The Clearing House.*" In a large room in Lombard-street, about thirty clerks from the several London bankers take their stations, in alphabetical order, at desks placed around the room; each having a small open box by his side, and the name of the firm to which he belongs in large characters on the wall above his head. From time to time other clerks from every house enter the room, and, passing along, drop into the box the checks due by that firm to the house from which this distributor is sent. The clerk at the table enters the amount of the several checks in a book previously prepared, under the name of the bank to which they are respectively due.

Four o'clock in the afternoon is the latest hour to which the boxes are open to receive checks; and at a few minutes before that time, some signs of increased activity begin to appear in this previously quiet and business-like scene. Numerous clerks then arrive, anxious to distribute, up to the latest possible moment, the checks which have been paid into the houses of their employers.

At four o'clock all the boxes are removed, and each clerk adds up the amount of the checks put into his box and payable by his own to other houses. He also receives another book from his own house, containing the amounts of the checks which their distributing clerk has put into the box of every other banker. Having compared these, he writes out the balances due to or from his own house, opposite the name of each of the other banks; and having verified this statement by a comparison with the similar list made by the clerks of those houses, he sends to his own bank the general balance resulting from this sheet, the amount of which, if it is due from that to other houses, is sent back in bank notes.

At five o'clock the Inspector takes his seat; when each clerk, who has upon the result of all the transactions, a balance to pay to various other houses, pays it to the Inspector, who gives a ticket for the amount. The clerks of those houses to whom money is due, then receive the several sums from the Inspector, who takes from them a ticket for the amount. Thus the whole of these payments are made by a double system of balance, a very small amount of bank notes passing from hand to hand, and scarcely any coin.

It is difficult to form a satisfactory estimate of the sums which daily pass through this operation; they fluctuate from two millions, to perhaps fifteen. About two millions and a half may possibly be considered as something like an average, requiring for its adjustment, perhaps £200,000 in bank notes, and £20 in specie. By an agreement between the different bankers, all checks which have the name of any firm written across them must pass through the clearing house; consequently, if any such check should be lost, the firm on which it is drawn would refuse to pay it at the counter; a circumstance which adds greatly to the convenience of commerce.

The advantage of this system is such, that two meetings a day have been recently established—one at twelve, the other at three o'clock; but the payment of balances takes place once only, at five o'clock.

If all the private banks kept accounts with the Bank of England, it would be possible to carry on the whole of these transactions with a still smaller quantity of circulating medium.

In reflecting on the facility with which these vast transactions are accomplished—supposing, for the sake of argument, that they form only the fourth part of the daily transactions of the whole community—it is impossible not to be struck with the importance of interfering as little as possible with their natural adjustment. Each payment indicates a transfer of property made for the benefit of both parties; and, if it were possible, which it is not, to place, by legal or other means, some impediment in the way which only amounted to one-eighth per cent., such a species of friction would produce a useless expenditure of nearly four millions annually: a circumstance which is deserving the attention of those who doubt the good policy of the expense incurred by using the precious metals for one portion of the currency of the country.

One of the most obvious differences between a metallic and a paper circulation is, that the coin can never, by any panic or national danger, be reduced below the value of bullion in other civilized countries; whilst a paper currency may, from the action of such causes, totally lose its value. Both metallic and paper money, it is true, may be depreciated, but with very different effects.

Depreciation of Coin.—The state may issue coin of the same nominal value, but containing only half the original quantity of gold, mixed with some cheap alloy; but every piece so issued, bears about with it internal evidence of the amount of the depreciation: it is not necessary that every successive proprietor should analyze the new coin; but a few having done so, its intrinsic worth becomes publicly known. Of course the coin previously in circulation is now more valuable as bullion, and quickly disappears. All future purchases adjust themselves to the new standard, and prices are quickly doubled; but all past contracts also are vitiated, and all persons to whom money is owing, if compelled to receive payment in the new coin, are robbed of one half of their debt, which is confiscated for the benefit of the debtor.

Depreciation of Paper.—The depreciation of paper money follows a different course. If, by any act of the government, paper is ordained to be a legal tender for debts, and, at the same time, ceases to be exchangeable for coin, those who have occasion to purchase of foreigners, who are not compelled to take the notes, will make some of their payments in gold; and if the issue of paper, unchecked by the power of demanding the gold it represents, be continued, the whole of the coin will soon disapper. But the public, who are obliged to take the notes, are unable, by any internal evidence, to detect the extent of their depreciation; it varies with the amount in circulation, and may go on till the notes shall be worth little more than the paper on which they are printed. During the whole of this time every creditor is suffering to an extent which he cannot measure; and every bargain is rendered uncertain in its advantage, by the continually changing value of the medium through which it is conducted. This calamitous course has actually been run in several countries; in France it reached nearly its extreme limit during the existence of assignats. We have ourselves experienced some portion of the misery it creates; but by a return to sounder principles, have happily escaped the destruction and ruin which always attend the completion of that career.

Every person in a civilized country requires, according to his station in life, the use of a certain quantity of money, to make the ordinary purchases of the articles which he consumes. The same individual pieces of coin, it is true, circulate again and again, in the same district; the identical piece of silver, received by the workman on Saturday night, passing through the hands of the butcher, the baker, and the small tradesman, is, perhaps, given by the latter to the manufacturer in exchange for his check, and is again paid into the hands of the workman at the end of the succeeding week. Any deficiency in this supply of money is attended with considerable inconvenience to all parties. If it be only in the smaller coins, the first effect is a difficulty in procuring small change; then a disposition in the shop-keepers to refuse change unless a purchase to a certain amount be made; and, finally, a premium in money will be given for changing the larger denominations of coin.

Thus money itself varies in price, when measured by other money in larger masses: and this effect takes place whether the circulating medium is metallic, or of paper. These effects have constantly occurred, and particularly during the late war; and, in order to relieve it, silver tokens for various sums were issued by the Bank of England.

The inconvenience and loss arising from a deficiency of small money fall with greatest weight on the classes whose means are least; for the wealthier buyers can readily procure credit for their small purchases, until their bill amounts to one of the larger coins.

As money, when kept in a drawer, produces nothing, few people, in any situation of life, will keep, either in coin or in notes, more than is immediately necessary for their use; when, therefore, there are no profitable modes of employing money, a superabundance of paper will return to the source from whence it issued, and an excess of coin will be converted into bullion and exported.

Since the worth of all property is measured by money, it is obviously conducive to the general welfare of the community, that fluctuations in its value should be rendered as small and as gradual as possible.

The evils which result from sudden changes in the value of money will perhaps become more sensible, if we trace their efforts in particular instances. Assuming, as we are quite at liberty to do, an extreme case, let us suppose three persons, each possessing a hundred pounds: one of these, a widow advanced in years, and who, by the advice of her friends, purchases with that sum an annuity of twenty pounds a year during her life: and let the two others be workmen, who by industry and economy, have saved a hundred pounds out of their wages; both these latter persons proposing to procure machines for calendering, and to commence that business. One of these invests his money in a Savings' Bank; intending to make his own calendering machine, and calculating that he shall expend twenty pounds in materials, and the remaining eighty in supporting himself and in paying the workmen who assist him in constructing it. The other workman, meeting with a machine which he can buy for two hundred pounds, agrees to pay for it a hundred pounds immediately, and the remainder at the end of a twelvemonth. Let us now imagine some alteration to take place in the currency, by which it is depreciated one-half; prices soon adjust themselves to the new circumstance, and the annuity of the widow, though nominally of the same amount, will in reality, purchase only half the quantity of the necessaries of life which it did before. The workman who had placed his money in the Savings' Bank, having perhaps purchased ten pounds worth of materials, and expended ten pounds in labor applied to them, now finds himself, by this alteration in the currency, possessed nominally of eighty pounds, but in reality of a sum which will purchase only half the labor and materials required to finish this machine; and he can neither complete it, from a want of capital, nor dispose of what he has already done in its unfinished state for the price it has cost him. In the mean time, the other workman, who had incurred a debt of a hundred pounds in order to complete the purchase of his calendering machine, finds that the payments he receives for calendering, have, like all other prices, doubled, in consequence of the depreciation of the currency; and he has, therefore, in fact, obtained his machine for one hundred and fifty pounds. Thus, without any fault or imprudence, and owing to circumstances over which they have no control, the widow is reduced almost to starve; one workman is obliged to renounce for several years, his hope of becoming a master; and another, without any superior industry or skill, but, in fact, from having made, with reference to his circumstances, rather an imprudent bargain, finds himself unexpectedly relieved from half his debt, and the possessor of a valuable source of profit; whilst the former owner of the machine, if he also has invested the money arising from its sale in the Savings' Bank, finds his property suddenly reduced one-half.

These evils, to a greater or less extent, attend every change in the value of the currency; and the importance of preserving it as far as possible unaltered in value, cannot be too strongly impressed upon all classes of the community.

For the Farmers' Register.

ON THE ADVANTAGES OF KEEPING INDIAN CORN IN THE SHUCK, OR HUSK.

The bread of Indian corn is that principally used by much the greater portion of the people of the southern states—and their choice is directed as much by taste and preference, as by economy. Corn bread is not liked by foreigners, or persons who have not been accustomed to its use: but if the taste for it is *acquired*, it is not the less strong, and enduring. But I, for one, maintain that *good* corn bread, in sundry of the many modes in which it is prepared, and presented at *country* tables, has a value that does not depend on habit, or the acquired taste of the consumer. But corn bread that is bad, whether from being cold or stale, or being badly prepared, or from being made of grain of bad quality, is indeed very poor food: and nineteen times in twenty, one or more of these causes affect the quality of the bread, even on the tables of the wealthy, and almost always of townsmen, who buy their meal ready ground. It is indeed surprising how little attention is generally paid to the quality of this most important article of food—and how many persons, who are abundantly careful, and willing to incur any necessary expense, to procure the best of other articles for their tables, are content with corn bread that is always bad, because made of weevil-eaten or filthy corn—heated in grinding by the rapid motion of the mill-stones—and probably, withal, imperfectly cooked. As to the last matter, though a very important one, I leave it to the consideration of the wives who read the Register. But as to the condition of the material used, *that* is a matter for the sellers and buyers of corn and meal to attend to, and to which little or no attention is paid by the seller, because little or none is required of him by the buyer. We are all very choice in the quality of wheat flour, and but few persons in comfortable circumstances, in Virginia, will be content with any but "family flour," which is a grade superior to the best sent abroad, (or to the best "superfine") and costs more by about 20 per cent.—making a difference of about $3 in the barrel, at the present very high prices. But for corn and its meal, there is seldom any difference of price on account of quality. If very foul, or damaged, a parcel offered for sale will probably be rejected at any price: but it rarely happens that there is a difference of price of 5 cents, or even 1 cent per bushel, between tolerable corn, or meal, and samples of the purest and sweetest. Hence the farmer and seller of the corn, is not operated on by self-interest, the strongest inducement to have it in the best condition. It is not therefore strange that purchasers should continually provide persons in their employment with bad corn bread, and have to eat it themselves, or to abstain from its use, which is more usual in town than country solely on this account. But it *is* strange, that farmers who eat of their own corn, should be so generally regardless of the proper preservation of the portion designed for bread at home, as well as of the greater mass for sale, and for feeding stock.

No kind of grain, in this climate, can be so easily and certainly kept free from deterioration of every kind, as Indian corn: and it is for that reason, that generally no care is taken for the purpose, except to keep it for home consumption in the ear, and usually in open log cribs, thus permitting the air to pass through the whole bulk. As the corn shelled, at short periods, for meal for the family, is taken from the ears, and these usually selected carefully to avoid the rotten ones that may have been admitted, the quality will not be materially injured by any outward contamination, as every thing of the kind is left among the shattered grain at the bottom of the bulk. But in most summers in eastern Virginia, and more south, the moth-weevil commences its depredations by July—and when they are plenty, every ear of corn receives more or less injury, and of a kind which cannot possibly be removed by a loss of quantity. The maggot of the weevil eats the greater part of the interior of the grain, leaving the outer surface untouched except at the small hole at which the mature insect comes out—the whole cavity remaining filled with its excrement and its cast skin. The extent of this loss of the substance of the grain, and of contamination to the portion left, varies with the season, and the exposure of the corn. But there are but few years in which corn kept in the usual manner as late as August, or wheat until September, does not furnish bread more or less injured by this insect.

Corn may be kept almost free from weevil, and every other cause of injury to its quality, by being put up in the shuck—using the precautions necessary for that mode, and which I shall proceed to state.

When housed in the shuck, it is necessary that corn should be perfectly ripened, and dry, both as to ear and shuck. I have so put up large quantities of corn, and with success, from the first to the latter part of November. But I would not advise it to be commenced before late in November, unless when the early maturity, and perfect dryness of the corn, left no doubt of its safety. The shucks should also be free from any accidental moisture from rain or dew, or from lying on the earth—and the house should be perfectly secure from the entrance of rain. The open sided log cribs, which are best for shucked corn, are not safe for that not shucked; because driving rains will penetrate at the sides, and the shucks, when thus made wet, cannot dry, as naked ears of corn would, and the dampness will affect more than the exterior ears. Close framed houses are therefore the best—and if the corn is dry, and perfectly matured, there is no danger from the largest bulk.

I have put up corn in considerable quantities, in this manner, though not with as much care as I now recommend to be taken by others, and never have had any injured, when in closely boarded houses. Some small losses were suffered, more than once, in open cribs, evidently by rain having penetrated—and in one case, the last crop, 1835—from the corn having been put up too damp. But of this crop, much corn, for want of being dry, was lost in great quantities, and in many places in every usual mode of being secured. Mine was put up under the management of a very careless agent, from whose carelessness so much other loss was sustained, that this one furnishes no evidence of the plan being unsafe in any case, with proper attention.

When corn is thus put up, the shucks covering the ears protect the grain effectually from the moth weevil, except the very few eggs that might have been laid in autumn, on forward corn, while standing in the field. Even of these few, probably but a small proportion will hatch, while so closely packed in bulk, and excluded from air, except at the surface of the bulk. Rats and mice, according to their number, of course will have their full share under any circumstances; but the protection of the shuck confines their depredations to the outer and exposed parts of the bulk, and guards all other parts from their filth. If these vermin, and the black weevil, could be guarded against, I believe that corn put up in the shuck might be kept securely, and in the best condition, not only through one, but for many years.

I confess that my opinions on this subject are not altogether practical, or sustained by full and sufficient experiments. It was not to keep sale corn in the best possible manner for bread, that my practice was begun and continued. Like other producers, I had no interest in taking much trouble to offer the commodity in *better* condition than consumers required, or would pay for. But when corn was below a remunerating price, (and that was generally the case from 1820 to 1830,) I preferred to keep my surplus, for the consumption of a future year. It was for this purpose that I commenced and continued the practice of putting up corn in the shuck; and it was once kept as long as into the third summer after being so housed, without *much* injury. This, the oldest corn I ever kept, then sold at from $3 to $4 the barrel, at the barn, after having been at less than $2 when first put up. The reason that there was *any* deterioration from age, was that less care was used than I have advised above. Besides this, to avoid taking up too much space, the stem of the shuck was broken off half-way in gathering, so as to leave the inner leaves only, instead of the whole, to protect the corn from weevil and other vermin. Still the corn in its third year of keeping was better than much that is sold and used for bread in the first, if in a bad year for weevil. Of corn kept in equally large bulks into the second year, I never sustained any injury or loss, other than by rats &c.

But there would be a more important object gained, both for public and individual interest, by the more general adoption of this plan, than merely having good and palatable bread. This would be the tendency to equalize the supplies of corn, and the prices, in good and bad years, and avoiding the great fluctuations which are so frequent in this staple product. Nearly all the corn made is consumed in our country, the foreign demand being extremely limited. The meal cannot be kept barrelled, like wheat flour, (unless kiln-dried,) nor will the grain keep good (as usually managed,) more than one year, if as much. Therefore the crop of each year is generally consumed in the course of the next. Besides—many poor and improvident producers will always glut the market with early sales, even if they have to buy again at double price before another crop comes in. For these reasons, no crop that we make fluctuates so greatly in price as corn. A very plentiful crop serves to make the price less than will pay for the production—and as nearly all is eaten, sold, or wasted within the next year, perhaps within a year after, with a short crop, the price may be doubled, or trebled. If it was the practice of many farmers to keep their surplus corn in the shuck in years of plenty and of low prices, to wait for a scarcity, the prices would never fall so low, nor rise so high, as heretofore. The farmers who would adopt the plan would profit greatly by always selling at good prices, and yet they would serve the public by their timely supplies, and by thus preventing prices rising as high as they would be, without such supplies.

It was not to prefit by selling at highly advanced prices that I commenced the practice of putting up and keeping corn in the shuck, though such was the result. Believing then (on account of the general low prices of this crop,) that I ought to avoid cultivating more land in corn than would *certainly* supply the next year's consumption, and therefore not designing to make it a principal sale crop—it was my purpose to keep the surplus of a large crop to supply a possible deficiency of a future year. But so great a deficiency never occurred to me, and sooner or later the corn remaining on hand was sold at a greatly advanced price. Between 1820 and '30, in lower Virginia, corn, at the farmers' cribs, was several times at less than 40 cents the bushel—and in some cases was offered at 20 cents, in large quantities. And yet no four years, if indeed three years, passed, without the price being as high at some time as 80 to 100 cents. In the interior, far from navigable water, the fluctuations of price are still greater than where near to navigation, or to market, because of the expense of carrying to market when abundant, and of bringing corn from abroad when deficient: and therefore, in such places, the plan of keeping it would be still more beneficial than elsewhere.

E. R.

EXTRACT FROM AN OLD WORK ON AGRICULTURE.

Systema Agriculturæ—*being the mystery of Husbandry discovered and laid open by J. W.* 1631.

Explanation of the Frontispiece.

First cast your eye upon a rustick seat
Built strong and plain, yet well contrived and neat;
And situated on a healthy soyl,
Yielding much wealth with little cost or toyl.
Near by it stand the barns, fram'd to contain
Enriching stores of hay, pulse, corn and grain,
With bartons* large, and places where to feed
Your oxen, cows, swine, poultry with their breed.
On the other side, hard by the house you see
The apiary for the industrious bee.
Walk on a little farther and behold
A pleasant garden, from high winds and cold
Defended, (by a spreading fruitfull wall,
With rows of lime and fir trees straight and tall,)
Full fraught with necessary flowers and fruits
And nature's choicest sort of plants and roots.
Beyond the same, are crops of beans and pease,
Saffron and liquorice or such as these,
Then orchards so enriched with fruitfull store,
Nature could give (nor they receive) no more:
Each tree stands bending with the weight it bears,
Of cherries some, of apples, plums and pears.
Not far from thence see other walks and rows
Of cyder fruits, near unto which there flows
A gliding stream; the next place you discover
Is where St. foyn, la-lucern, hops, and clover
Are propagated; near unto these fields
Stands a large wood, mast, fuel, timber yields—
In yonder vale hard by the river stands
A water engine, which the wind commands
To fertilize the meads; on t' other side
A Persian wheel is plac't both large and wide
To the same intent; then do the fields appear
Clothed with corn and grain, for the ensuing year.
The pastures stockt with beasts, the downs with sheep—
The cart, the plow, and all good order keep.
Plenty unto the husbandman, and gains
Are his rewards for industry and pains:
Peruse the book, for here you only see
The following subject in epitome.

From the Farmer's Series of the Library of Useful Knowledge.

SOILS.

Imperfect as was the knowledge of husbandry in former times, yet our forefathers were enabled to distinguish the qualities of the soil with great accuracy; for those parts which were the most anciently cultivated, and which formed the infield land around their villages, are found at the present day to consist of the best ground when in its natural state; though much of that which has been since broken up has been greatly improved by the application of manures, and the progress of successful cultivation.

The difference in quality of the fruits of the earth—more particularly remarkable in grain—though distinguished in many places by the names of the districts in which the corn is grown, yet does not arise from any other cause than dissimilitude of soil and climate; and the utmost exertions of cultivation can only to a certain degree improve, but never effect any absolute change in the indigenous nature of its productions. This, indeed, is generally admitted, so far as regards soils; but although they may be apparently of the same kind, yet their fertility is materially affected by climate, notwithstanding they may be situated in nearly the same part of the country, and with little variation of level; for although the heat indicated by the thermometer may correspond, yet the temperature of the air is varied according to the aspect of the land—whether exposed to the north or south and the prevaling winds occasioned by the position of adjacent highlands and vales—and the seasons are thus rendered earlier or later. The natural situation of a farm—independently of its local connexion with roads and markets—is therefore an object of the first importance, and affects its value much more than is commonly supposed; for the estimation of all the vegetable products of this country depend, with very few exceptions, upon the degree of heat which they enjoy during their growth; and it is well known that when the soil is dry, and the harvest early, corn of the same weight yields more saccharine matter than that which is produced under less favorable circumstances.*

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* Sheds.

* This has been clearly established by the application of the *saccharometer*—an instrument invented for the use of malsters, brewers, and distillers, for the purpose of ascertaining the strength and value of worts. The common standard by which the value of grain, of

No two farms can indeed be found precisely situated, in point of soil situation, climate, and exposure; and a very small difference in any of these circumstances will occasion a great diversity in their fertility; consequently no rules can be strictly applied to their management. It has, however, been justly observed, 'that farms thus variously soiled are spurs to ingenuity—obliging their occupiers to break through those confined opinions and narrow prejudices which are too frequently contracted in countries where a uniformity of soil and regular routine of management prevail.'*

From the vague manner in which soils are frequently described, and the various acceptation of the same terms in different counties, it is difficult for a farmer who reads an account of the agriculture in any other district than that in which he resides, to judge what relation such a soil may bear to that which he himself occupies. In some parts of England, any loose clay is called marl, and in others it is called loam; while this is defined by one to be a fat earth; and by another, a mixture of clay, sand, and calcareous earth, without stating the proportions. Regarding the latter, it has indeed been remarked by the late Mr. G. Sinclair, that, on referring to books on husbandry and gardening, we are directed to a hazel loam, a brown loam, clayey loam, or to a humid sandy soil, peat earth, garden mould, &c.; but the want of proper definitions of those terms is so perplexing, that it is really impracticable to determine what kind of soil is meant: thus, of upwards of fifty different kinds of soil and composts examined by him in various parts of the kingdom, those under the same name were found to differ greatly in their respective qualities. The method of determining the nature of soils by chemical analysis has, however, been of late years so much simplified by Sir Humphrey Davy, that it is now in the power of every practical person to ascertain their properties, without much risk of being mistaken.†

Composition of Soils.

The surface of the earth is composed of various descriptions of matter, chiefly minerals—viz., clay, lime, marl, gyps, fluor, talc, sandstone, slate, quartz, and barytes. These are the names by which geologists distinguish the different kinds of rock (whether in solid masses or pulverized) which compose the superstratum, and which, when reduced to an incoherent mass, forms the soil, or what we call the arable staple of land.

In order to convey clear ideas of the components of arable soils, brief notices of the different earths may in the first place, be given—in order to lead to a right understanding of how one kind of soil is more fertile than another, and also how any one may be improved by admixture with another.

Clay is an earth consisting of several varieties, differing in color, tenacity, and some other particulars. Blue clay is found in immense beds, under the channel of rivers, in the bottom of valleys, or forming the superstratum of hills over chalk or limestone. Almost every kind of clay contains qualities favorable to vegetation: more especially those varieties which are decomposable by the action of frost, or the alternate effects of showers and sunshine. A surface of pure clay requires to be long under cultivation before it becomes favorable for the operations of husbandry; but when thoroughly reclaimed, no description of soil yields more abundant crops.

Calx is lime combined with acids. To this description of earth, chalk, powder-chalk, and all the different sorts of marble, belong. The two former are found in vast masses forming some of our highest hills on the south of England. They no where constitute the arable surface, except on the margins of the hills formed of them; but are discoverable, in a reduced or powdery state in almost all our best soils. A portion of lime earth is an useful addition to all soils, particularly clays and dried gravel. Being attractive of moisture, it assists the effect of frost on clay, and gives consistence and coolness to light land in summer.

Marl is calcareous, or lime earth, mixed with clay. The common marl has a soft unctuous feel, and is found in thin strata, or in beds of considerable thickness, in various parts of the kingdom. A marl-pit of this description is a valuable source of riches to the light-land farmer: a good coat of it bestowed on a sandy or gravelly field effects the greatest improvement—not only by giving consistence to the staple, but also adding a fresh accession of vegetable food; and that called shell-marl acts powerfully upon the improvement of clays.

Gyps is calcareous earth saturated with vitriolic acid. This peculiar earth is found in a loose state at Glipston Quarry, in Northamptonsire, and in several places on the continent. In its solid forms it recives the names of alabaster, plaster-stone, or selenites. Being heated, it falls to a fine powder,

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apparently equal quality, is usually estimated, is that of the weight in proportion to its cubical measure; and when the corn is to be manufactured into meal, this must ever be a primary object, though subject to many deductions, which also enter into the consideration of the miller. But among those who require it for the purpose of brewing, the saccharometer is a more certain criterion—as, whatever the weight of the grain may be, its strength, or nutritive power, will be in proportion to the quantity of the saccharine matter which it contains.

* Marshall's Rural Econ. of Yorkshire, 2nd edit., vol. i. p. 281.

† All soil contain sands of various degree of fineness, and impalpable earthy matter; when, therefore, the exact proportions in which these are combined in a soil are ascertained, it shows directly to what class it belongs—whether the loamy, clayey, calcareous, sandy, peaty, &c. Sir H. Davy, however, states, in his Agricultural Chemistry, 'that the term *sandy* should never be applied to any soil that does not contain at least seven-eighths of sand. Sandy soils that effervesce with acids should be distinguished by the name of *calcareous sandy soils*, to note the difference which exists between them and those that are silicious. The term *clayey* should not be applied to any land that contains less than one-sixth of impalpable earthy matter, not considerably effervescing with acids. The term *loam* should be limited to soils containing at least one-third of impalpable earthy matter; and a soil to be considered as *peaty* ought to contain at least one-half of vegetable matter. These may be considered as the genuine characters of soils, and determined by a very simple process—that of washing the impalpable earthy matter of the soil from the sandy portion, and by drying and ascertaining their respective weights—when the application of an acid shows whether it belongs to the calcareous or the silicious kind of soil.'—Sinclair's, Hort. Gram. Woburn., p. 118.

which, when mixed with water, forms plaster. Gypsum has been highly extolled as a manure, particularly for grass land: yet its use, as we have already seen, has not been generally persisted in; but there can be no doubt that it acts as a powerful stimulant to vegetation, and probably future experience may induce its more frequent employment.

These are a few of the names given to the different earths found on the surface of our globe. In beholding their individual structure and stratified appearance, we cannot be otherwise than convinced that even the hardest were once in a state of fusion; and that the various strata have been, at greater or lesser intervals of time, superposed on each other by the mighty agents of nature. According to their situation or composite character, these strata are denominated *first*, *second*, or ***third*** formations. Of these, other deposites are formed, called ***shifted formations***—because they have been removed from a first to a second place. In these transitions, fire, as well as water, has been active; as its effects in the disruption, transformation, and elevation of parts of the various strata sufficiently evince.

But it is to that grand convulsion of nature, the flood, and to many local and partial inundations which have since taken place, that the present habitable face of the earth has received its peculiar character as to the undulations, consistence, and qualities of its varied surface; for whether the land emerged from the deep, or was only overflowed for a time, the effects of the surface by the subsiding waters would be the same. Hence we see that the most ponderous and solid accumulations resisted the current, and the loose and lightest were removed to a distance; the different deposites taken place according to their specific gravities, or the strength of the current which bore them along. Of these different earths, deposited as we find them at the present day, the foregoing are the principal. The cultivable surface, or soil, is compounded of dissolved portions of these different earths in various degrees of commixture, each possessing different properties and qualities, more or less favorable to the growth and sustentation of plants; and this according to the quantity of decomposed vegetable or animal matter they may contain. As they differ in constitutional composition, and as they are variously affected by the changes of weather, so also do they require different culture, as remains to be shown.

Clays.

From the brief description already given of this soil, it will appear that it is impervious to, and retentive of, water; and therefore the laying it as dry as possible is the first and only practical means of improvement. A clayey surface is generally undulating and declivous, consequently favorable for the operations of the drainer. Diagonal, or gently winding furrows, or underground drains, carry off water much more steadily and effectually than laid in direct or precipitous channels, because there is less hazard of the current being so impetuous as to disturb the retaining sides or block up by drift the openings of the drains, or course of the furrows. Hence we see in old husbandry the propriety of, or the reason for laying the lands or ridges in such tortuous or winding directions, and withal so much gathered in the middle. By this disposition of the surface, water is effectually, though slowly discharged; and the whole laid and kept dry.* In laying the surface in due form, the plough is the only efficient implement; but where local circumstances oppose the completion by the plough alone, the spade must be employed. Deep ditches are always necessary in a clayey country; for the soil imbibing but little of hasty showers, heavy rain, or melting snow, outlets should be numerous as well as capacious. Before undertaking an expensive design of underground draining, the depth of the surface stratum of clay should be ascertained; because, if it reposes on a bed of gravel, chalk, or stone, the surface water may be got rid of with but little trouble. Openings made through the clay in places where surface water naturally settles, will probably allow all excess to sink.

It is hardly necessary to allude to the great advantages arising from the perfect drainage of a clay soil: it gives firmness to the surface, thereby facilitating all the operations of cultivation; it adds an extra warmth to the air above it; manures the crops earlier, and more perfectly; and renders all trespassing of cattle or carriages less injurious.

The next most important aim of the cultivator of clay land is to counteract the natural tendency of it to *run together*. This can only be done by deep ploughing, and incorporated with the staple any kind of friable earth—such as sand, chalk, marl, and manures of all kinds. These, besides enriching the land, keep it more porous, and consequently more penetrable by all atmospheric influences. The deeper the staple the more fertile it is, and also more manageable on all occasions. Any excess of rain received upon the surface sinks away therefrom to the bottom of the staple, or arable superstratum; and though it may be upheld by the undisturbed pan, it oozes imperceptibly away over it to the lower end of the slope.

Much attention is required with regard to the time, or rather to the state, of a clay soil which is about to be ploughed. If too dry, it breaks up in unmanagable clods very difficult to be reduced to requisite fineness for sowing; and if too wet, it lies sodden in whole furrows, poached into holes by the feet of cattle, and altogether unreducible by the harrows. The due temperament is when the clods can be crushed without kneading under the foot or roller. In this state it may be got in order for any crop with the common implements.

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* It must however be admitted, that great loss and inconvenience arise from this ancient mode. In undulating countries the lands are decidedly the best to be as nearly flat as the formation of the furrows will admit—and in low districts, the fall for the water is reduced in equal ratio with the raising of the ridges. This robs the furrows of their due portion of soil—keeps them so full of moisture as to prevent their being made, or kept, free from weeds and aquatic grasses—and renders all the operations of the husbandman more troublesome to perform. On sheep-farms these hollow furrows ought never to be seen, as the loss occasioned by the death of sheep from getting "*over-laid*" in them, would amply repay the expense of levelling them, without burying the better soil. For the mode of executing this work, see Reports of Select Farms, No. V. Scorcby· Pp. 13, 14 in the Farmer's Series of the Library of Useful Knowledge.

The general character of clay farms is, that though the crops are abundant, they are cultivated at great annual expense. Great strength of teams and implements, and much tear and wear occur, in consequence of the more frequent need of fallows. When a heavy soil becomes foul with root weeds, there is no remedy like fallowing; its stubborn adhesiveness does not allow of freeing it from weeds by any other means than by repeated ploughing and exposure to a summer's sun. While the weeds are destroyed, the soil is ameliorated; and in autumn is fit to receive a dressing of manure followed by wheat seed. If pretty free from weeds, it may receive what is called a winter fallow—*i. e.*, ploughed in the autumn—lie all winter to be reduced by the frost—and in the spring it will be in order to have seed sowed upon it as soon as it is dry enough to be harrowed. Some such clay soils are regularly fallowed every third year, which is certainly a great loss to the tenant, when not duly provided for by the terms on which he holds his land, and indeed, in all cases, to the community; but there appears no remedy—at least, no profitable remedy. For notwithstanding machines have been invented, and much ingenuity exercised, to break and loosen the hardened surface of clay soils for the reception of seed, yet, though a passable crop might follow this breaking or rubbing (as it may be called) of the surface, it was soon found that the deep-rooting perennial weeds were neither checked nor destroyed: so that the practice was soon abandoned. There is, however, some descriptions of heavy land where no fallowing is required. Wheat and beans, or other corn, and clover succeed each other alternately, and the weeds which are nurtured by the wheat are kept under by the hoe during the growth of the beans. An opposite description of heavy land is called hungry clay: this is commonly mixed with gravel, impregnated with a considerable portion of iron ore. Very few plants enjoy themselves on this kind of soil, and it is only improvable by thorough draining, liberal dressings of lime or chalk, and frequent dunging. In the neighborhood of chalk hills this kind of land is often met with, and is much improved by a coat of pure chalk;—to obtain which, pits are sunk in the fields down to the rock, whence the chalk is drawn in the manner detailed in Ch. XII. In all those countries where chalk abounds, the fields are indented with circular hollows, showing where the rock has been excavated below; and from the very many large dells to be seen in the same districts, now filled with fine old oak trees, it is evident that chalk—either as it is naturally found, or after being burnt into lime—was in very early times extensively used for improving the surface of the land.

Clay is improved by chalk, in consequence of the latter breaking the consistency of the former. If drawn and laid on in the autumn, the frost will reduce the lumps during winter, so that it may be ploughed in at seed-time, or when the field is fallowed up. The pulverizing or reducing effect of chalk on clay is occasioned, as before mentioned, by its power of attracting, at all times, a large portion of water from the earth or air; and this being congealed by frost, swells and disturbs every particle near it. Its mechanical reduction of clay facilitates all operations, and renders it in every respect fitter for the growth of plants. When chalk is burned and slaked by water, or in the air, before being laid on land, its effects are an immediate and powerful stimulant to vegetation, besides freeing the land from slugs and insects.

Calx or Lime.

It has already been observed, that chalk, though one of the primitive earths, is never, in a pure state, found forming an arable surface. It is, nevertheless, present perhaps in all good soils; and, from what has been remarked of its properties above, it should be the endeavor of the farmer to make use of it as much as possible;—though in saying this, it must be of course understood that it is to be employed with a due regard to prudence. It is equally beneficial to clay, sand, gravel, and peat-earthy soils; and though not, perhaps, the direct food of plants, is a prime agent in preparing vegetable or animal matter already on the soil to yield nutrition to all.

Caustic lime is supposed to be a preventive against that disease in wheat, commonly called smut; not only in preparing wheat seed, but by dressing the land with it before sowing. Whether it be a cure for this disease is, perhaps, questionable, because we know it is not in every instance effectual; but we are quite sure that the wheat crop will be greatly improved by such a dressing. Clover leys, intended for wheat, are much infested by slugs, which often, if not prevented, prove ruinous to the crop. In such a case, a liberal cast of quick-lime should be given before the plough, which will either kill, or so disable the slugs, that no danger need be apprehended from their depredations. If the lime be not given before sowing, it may be applied after the wheat is up if necessary. It may either be sowed by hand, from seed-kits, or from a light cart with shovels. Night sowing, when the dew is on the blade, is most effectual; because the slugs are then feeding. If rain fall soon after the lime is sown, its burning quality is lost, and no longer offensive to the slugs; in which case, another dose will be necessary.

Of the other descriptions of earths, there are only two combinations of them which are particularly interesting to farmers, viz., sand and loam.

Sand and Gravel.

Sand, if dry, is easier and less expensively cultivated than any other. Though very subject to be infested by quetch and other running rooted weeds, it is readily cleared of them. The crops raised on sand are sooner ripe, and some descriptions are of finer quality than those from richer and stronger gound; but the bulk is deficient in both corn and straw. The liability of sandy land to suffer from drought is a great drawback on the profits of cultivation. In dry summers, the crops are sometimes hardly worth collecting. At the same time, no land pays better for improvement, provided the means are at hand and the force sufficient. Whatever application has a tendency to give it compactness, will also make it more retentive of moisture. For this purpose, clay, marl, chalk, or any other earth of a heavier description, will greatly improve the staple. For sheep husbandry, a sandy soil is well adapted; the treading and tail dress of the flock is invaluable for such land.

Whatever has been observed relative to sand, is equally applicable to *gravels* and all other light land liable to suffer from drought.

Like sands, they possess various gradations of quality, from almost absolute barrenness to great fertility. The former are in general termed *hungry soils*, from their tendency to absorb manure without any corresponding benefit to the land; but as their staple becomes firmer by the admixture of other earth, so do their properties improve. The richer kinds produce every species of grain, and though the looseness of their texture renders them less suited to the cultivation of beans and wheat, yet they are admirably adapted to that of Lent corn. The quality of the grain is likewise good; and being also favorable to the growth of leguminous crops and artificial grasses, they are commonly called *turnip soils*, from that root being generally cultivated on such land. It may be worked as arable land in any season, and is sound enough in grass to bear stock in winter.

Sometimes clay and gravel lie in alternate strata, *cropping out** on the sides of hills. This is one of the worst descriptions of arable land, in consequence of the great number of land-springs flowing out of it; difficulty of drainage, and its liability (in consequence of stones and clay being so firmly bound together) to become impenetrable by the plough after a dry time. It is in this species of land, too, that we often find both the gravel and clay tinged with the oxide of iron, than which nothing is more injurious to corn crops.

There is another kind of land, very widely spread throughout our southern counties, which, though not properly of a gravelly nature, yet is so intermixed with loose stones of a moderate size, as to bear some resemblance to soils of that description. The staple, indeed, is more commonly of clay than sand, and the stones are chiefly *flints;* which may be justly supposed to affect the quality of the earth with which they are mingled, by imparting to it something of their calcareous nature, for the land in which they are found is very generally fertile. There is in Yorkshire a singular species of it, called red-stone land, which is composed of loams of different qualities, intermixed with a greater or less quantity of soft sandy stones, about the ordinary size of flints, and of a dark yellew or orange color; a species of grit or freestone. The cultivated soil is in some instances, nearly half of it made up of these stones, and Mr. Marshall describes it as 'beyond dispute, one of the finest corn soils in the kingdom.'† He likewise mentions instances—which we have also witnessed in some parts of Kent—of great quantities of these stones having been gathered off as an incumbrance to the soil, by which its productiveness was much lowered; but the stones having been returned, it was restored to its former state of fertility.

Loam

is the name given to that kind of soil which appears to be an intimate mixture of all other earths reduced to a fine and equable state. It is of different colors. On elevated table-lands, it is mostly red; on gradual slopes, it is yellow or hazel; and in the bottom of valleys, it is almost black. The two first appear to be deposites from the general, the last from partial, floods. It is found reposing on stone, on clay, or on gravel, of various depth, sometimes in deep beds, but, in general, always deep enough for every purpose of the farmer. Its consistence is friable; readily admitting air and rain, and as readily discharging all excess of the latter, only retaining or imbibing from the air as much as is necessary to vegetation; and neither liable to be parched in summer, nor drenched and chilled by surface water in winter.

Loam in its uncultivated state, always contains a notable proportion of that nameless peculiar quality, so nourishing and stimulating to plants, known only as the constituent of virgin or maiden earth—*i. e.*, unexhausted earth. Whatever this quality may be, it is not only more abundant, but also much more permanent in loam than in any other description of arable land. Besides this property, the facility of its culture must not be forgotten. Except in hard frost, or immediately after a heavy fall of rain, it is ploughed at any time with ease and regularity; harrowed, scarified, hoed, by horse or hand, and rolled effectually. Such a soil rarely suffers from drought, nor are floods ever dreaded. If, from neglect, it be overrun with weeds, they are soon extirpated; and if impoverished by mismanagement, it is quickly recovered. It is suitable for every kind of crop, and every system of husbandry; and whether for corn or grass, yields the greatest profit to both landlord and tenant.

Such being the history of a loamy soil, it is coveted by every cultivator, and every industrious one endeavors to bring his land of an opposite character as near to the standard and nature of loam as possible. The expediency of such attempts is universally admitted; but it is only under particularly favorable circumstances it can be accomplished to any great extent. Covering a large field of sand with clay, or of clay with sand, is a formidable affair, which but few can undertake. Still, as there can be no doubt of immediate advantage and ultimate success, such an amelioration should never be lost sight of by the farmer of either a too light or too heavy a soil. Sometimes the opposite qualities lie contiguous, and in a course of years may be brought to improve each other. And though, in many cases, the desired quality may not be on the surface, it may happen to be found at no great distance below, sand and clay being often found stratified with each other.

There is also a species of rich loam which, under the name of *alluvial soil*, is understood to mean land which has been gained in low situations by deposites laid by the overflowing of streams from higher grounds, or by the artificial process of warping from the turbid waters of muddy rivers, as well as by slimy matter, thrown up by the tides, and afterwards embanked. This contains a large proportion of vegetable and animal matter, which gives it a dark color, and produces almost inexhaustible fartility; but the quality of its products, though luxuriant to the eye, are not, as we have already had occasion to remark, equal nutriment to those grown on drier land. This is not alone observable throughout our own country, but in every other part of the known world: thus, in Valencia, one of the most highly-cultivated and the richest districts in all Spain, the soil, though rendered wonderfully fertile through a regular command of water by tanks constructed in the time of the Moors, and appropriated to irrigation, yet its products are found so deficient in real nutriment as to have passed into a proverb expressive of their inferiority in the power of imparting vigor.* So, also, in a large lowland quarter of the island of Martinique, called the *Lamentin*, nothing can exceed the apparent richness of the vegetation: the canes grow to immense size, but the sugar, though beautifully white, is almost an impalpable powder, so scantily possessed of those crystals which constitute its saccharine strength, that it decomposes when carried across the Atlantic, and is almost useless to the refiner.

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* A term used by miners to signify the highest edge of the bed of coal, &c., or where it appears on the surface.

† Rural Economy of Yorkshire, 2nd Ed., vol. i., U. p. 280.

Peat.

Besides the above-mentioned earths, there is a class of others called *inflammables*, from their property of being combustible. These are coal, bitumen, peat, &c., which, when reduced to powder and incorporated with, or even spread on, the surface, act beneficially on vegetation. The ashes, too, of these minerals are a good dress, especially for cold moist soils.

That which falls under the denomination of peat, is distinguished in its natural state from every other kind of soil. It is formed of successive layers of heath and other course herbage, which spring up and decay upon the sward, without having a temperature of sufficient heat to effect their entire decomposition; but being aided by a certain degree of humidity, they continue to produce other plants which at length constitute that mass of vegetable matter, which is so common in Ireland and Scotland and our northern counties, under the names of bog and peat. It is of a dark color and spongy texture; full of fibrous paritcles in a partial state of decay; tough and elastic; and when dried, becomes inflammable. From this description, it might be supposed that it contains the chief elements of fertility; yet experience proves the contrary: for it is found, when in a state of nature, to be so completely barren as hardly to deserve the name of soil, until art and labor have been exerted to bring it into a state fit for tillage. By these means it has, in some instances, been brought to the consistence of a light kind of land, extremely well adapted to the culture of potatoes and other tuberous roots, as well as the lighter species of grain and flax, and somewhat resembling loam. It indeed wears the appearance of a rich mould, and may thus deceive an inexperienced eye; but, unless greatly ameliorated by the mixture of some solid earth, it is found, on closer examination, to be loose and porous, quickly saturated with water, and too easily discharged from it.

A late writer on the subject remarks, "that when we consider the vast extent of the masses of this bog, which, in the cold and temperate regions, overspread so great a portion of the surface of the earth, and which, though full of vegetable matter, is yet little friendly to vegetable life, we may believe that in its history, in its nature, and in its uses, it presents many materials to the agriculturist for inquiry, which may illustrate the means of either converting it into a soil or into manure, for the improvement of other lands: but it must be confessed that these important inquiries have not all been so perfectly answered as is to be desired; and that much yet remains to be learned of the nature and the uses of peat-moss."*

It only remains to be noticed that there are two other constituents of soils, namely, *salts* and *metals*, and which, where they abound, have a powerful effect on plants. Of the latter, iron is the most frequent, and, when in excess, is prejudicial, especially to corn crops. The ores of other metals, as lead and copper, are also hurtful to vegetation; but this only appears in the near neighborhood of mines.

Of salts, there are many descriptions found in land springs, and usually recommended for medical purposes. Their existence in arable land is, however, imperceptible, unless very near salt springs. Sea, or common mineral salt, though not a food of plants, is, notwithstanding, a useful ingredient, particularly in dry soils. Its great affinity for water assists summer crops wonderfully. It is also an excellent cleanser and renovator of exhausted soils. Slugs will not live where it is in any sensible quantity; and while it is grateful to cultivated plants, it appears to be offensive to moss and all diminutive weeds. Its use as a dress is too much neglected by farmers.

There is thus an endless variety in soils, and those of apparently equal fertility are almost all differently composed. A certain knowledge of chemistry is necessary to ascertain in what those differences consist; for it is in the accuracy with which they are described that the best modes of remedying their defects, and improving them by the application of either lime, clay, sand, or other fossil substances, can be discovered. Farmers, however, generally contrive to obtain a tolerably correct notion of their imperfections by a comparison with the soils of their neighbors, and thus experience in such cases supplies the want of science. The sure indications of a good soil are commonly to be found in the state of the hedges and timber, especially oak and ash—full, wide-spreading tops presenting an appearance of luxuriant growth; whereas, if stunted, it is a certain sign that the land is poor. The weeds, natural to peculiar soils, are also strong proofs of either poverty or fertility. Land is, in certain cases, also to be distrusted, although the crops upon it may be fine; for they may have been forced by over manuring, and thus brought to a condition which it may be found very difficult to continue: while, on the contrary, good land, though exhausted by improper cropping, may be easily restored by judicious management.

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* It is not very expressive of gallantry, and runs thus:—

"*En Valencia, la yerva es agua,*
La carne es yerva,
Los hombres son mugeres,
Y las mugeres—nada."

In Valencia, the grass is water,
The flesh is grass,
The men are women,
And the women—nothing.

* Mr. Low, on the Classification of Soils, Quart. Jour. of Agri., N. S., vol. i. p. 30.

Few soils are so ungrateful as not to pay the expense of improvement, provided the money laid out upon them be applied with judgment. Many tracts of the poorest sand have been rendered fertile by judicious dressings of clay, loam, or marl, and other thin and hungry soils have been improved by the application of similar substances; while those of the sourest description have had their acidity corrected by lime, chalk, and ashes. It should, however, be borne in mind, that land, of any description, which is retentive of water, can never be rendered fit for the plough until it has been completely drained; for otherwise, the operations of tillage cannot be accomplished in due season. Its state will have a direct and prejudicial effect upon its productive powers; and manures can never communicate their full benefit to any soil which rests upon a wet bottom.

From a London Paper.

GRINDING OLD GARMENTS INTO NEW.

Sir George Head, in his *tour through the Manufacturing Districts*, gives the following account of a new trade carried on at Dewsberry; literally tearing in pieces fusty old rags, collected from Scotland, Ireland and the Continent, by a machine called the "devil," till a substance very like the original wool is produced. This, by the help of a small addition of new wool, is respun and manufactured into sundry useful articles, such as the wadding which Messrs. Stulz & Co. introduce within the collars of their fashionable coats, and various descriptions of drugget, horse-sheeting, &c. The trade or occupation of the owner, his life and habits, or the filthiness and antiquity of the garment itself, oppose no bar to this wonderful process of regeneration, whether from the scarecrow or the gibbet, it makes no difference; so that according to the transmutation of human affairs, no doubt it frequently does happen, without figure of speech or metaphor, that the identical garment to-day exposed to the sun and rain in a Kentish cherry orchard, or saturated with tobacco smoke on the "back of a beggar in a pot house," is doomed in its turn, "perfusus liquidis odoribus," to grace the swelling collar, or add dignified proportion to the chest of the dandy.

From the Genesee Farmer.

AGRICULTURAL READING.

The advice of the justly celebrated Bakewell, a man who did more perhaps to advance the interests of the agriculturist, and render him prosperous, than any man of the age, to those young friends who as farmers called upon him, was, to "spare no pains to know what others were doing." This could only be done through the medium of agricultural journals, and hence he was, as may well be supposed, one of their ablest advocates, as well as a constant contributor to their pages. Experince has shown, that to be a successful farmer at the present day—to enter the vast field of agricultural competition on equal terms—a man must know what others are doing; he must be acquainted with the improvements in husbandry, in labor saving machines, in the preparation and application of manures, and with the new and improved breeds of cattle and sheep that have within a few years been introduced.

To possess this knowledge is one thing—to make a judicious use of it is quite another. The first he must acquire from extensive personal observation, or from agricultural works; the last must be the result of reflection, combined with experience. Without the first, he will be behind the age; without the last, he will be a farmer at random, a mere visionary in theory, incompetent to his business, and a loser in practice. Judgment, sound judgment, is required to render available knowledge, and where these two are combined, the result will be a successful farmer.

Many of these farmers at the present time, we mean those who make the best use of their capital and realize the greatest profits, are men who enter into competition with long established agriculturists, utterly ignorant, so far as personal superintendence or labor was concerned, with the business of farming. They were professional men, divines, lawyers, merchants, or mechanics; unacquainted with the mechanical part of their new occupation, but bringing to the work minds well stored with varied and useful knowledge, and a thorough acquaintance with the advanced state and best methods of modern agriculture. The voluntary choice of such men proves that they have a taste for one of the noblest occupations of mankind, and entering upon it with zeal, they meet with a success to which many of those who have been brought up to farming from their infancy remain strangers.

It is sometimes said by those who decry agricultural reading, or book farming, as they are pleased to term it, that you cannot *make* a farmer, he must be brought up to it, or he cannot succeed. The celebrated Marshall of England thought differently; he maintained that "attendance and attention will make any man a farmer." He was brought up a merchant, but at mature age, took a poor farm of three hundred acres in the vicinity of London, and commenced farmer. All his friends prophecied a total failure, but he prepared himself by studying the best agricultural works of the day, and by reflection—superintended his business himself—kept an accurate journal of his operations, which he afterwards published—and became very rich, the Coke or Bakewell of the farmers of his day. The same thing has happened, and is almost daily happening in this state. Professional men and mechanics have become our most able and successful farmers—showing the best regulated and well managed farms—exhibiting the finest cattle, sheep and hogs—giving a flat contradiction to the doctrine, that books will not make good farmers; and what, in the estimation of many, will be more than all the rest, as furnishing the test and proof of the whole, putting more money in their pockets than any of those who have been regularly bred to the business.

The time has come when the farmer in self-defence must read; not to become a mere theorist or visionary in agriculture; not to keep constantly changing his systems, but steadily improving them; but because to ensure success, and keep pace with others, he must know what others are doing.

G.

From the Tennessee Farmer.

JERUSALEM ARTICHOKE.

This plant is in a peculiar manner fitted to grow under the shade. It can therefore be cultivated in woods; and it is sometimes sown in England to afford shelter for game; the plants being left to reproduce themselves annually from tubers.

Taken into account the hardy qualities of this plant, its productiveness and easy culture, it may be doubted whether it merits the universal neglect into which it has fallen. Granting its inferiority as an article of food to the plants now cultivated for our domestic stock, it must be of some importance to have a plant that can be so easily cultivated, and on soils so low in the scale of fertility.

GREAT HEAT AT THE EARTH'S CENTRE.

M. Arago, by examining the temperature of a well 900 feet deep now being dug at Paris, thinks he has ascertained the ratio of the increasing temperature of the earth towards its centre, so that at the tenth degree from the surface all known matter must be in a state of fusion. At the point to which the perforation in question has reached, M. Arago expects a spring of water will arise of a sufficient degree of heat to warm public establishments, supply baths, and serve for other purposes.

MARL IN NEW ENGLAND.

Professor Hitchcock of Amherst College, has discovered extensive beds of marl in Springfield, West Springfield, and South Hadley, Mass. He says, "I have examined banks of this substance, which may properly be called *diluvial marl*, in West Springfield, for a mile or two along the north side of Agawain river, where millions of cart loads of it may be obtained; and this is directly on the proposed route of the rail road from Springfield to Albany. It occurs also, half a mile south of the village of West Springfield, a little southeast of the bridge, on the road to Suffield; and I have no doubt but it underlies most of the plain, extending at least as far as Hartford.

On the east side of Connecticut river, this marl appears in several places, along Chicopee river, near Cabotville and Chicopee factories; especially at the quarries of stone, where it has been cut through by the excavations. In the north part of Springfield, on the bank of Connecticut river, only half a mile from South Hadley canal, the marl forms a high bank for a considerable distance, and I saw it also a short distance south of the centre of South Hadley. Indeed I can have no doubt that it may be found, more or less abundantly, beneath the sand and clay, all the distance from South Hadley to Springfield."—*Connecticut Courant.*

From the Southern Agriculturist.

ON THE ADVANTAGES OF CELLARS FOR SWEET POTATOES.

Mr. Editor:—Most planters during this month will be getting in their potatoes, and I shall contribute my mite, by giving my brother planters a few hints as to the *time of digging potatoes*, and the *best mode of putting them up*.

Long experience has taught me, that after a spell of dry weather is the best time for digging in sweet potatoes. When thus collected, they are less liable to rot, from their being more dry, and not so apt to sweat when put in the cellar. In digging in my potatoes, I always use the daggon plough. This I run down both sides of the bed, and throw off a deep furrow. After doing this, I use the hoe to remove the earth, which still remains about the roots. I consider the use of the plough very great in getting in my potatoes. Some persons have objected that it cuts the potatoes; but this is an objection, not founded on fact. From actual trial with the plough, I find that not one half the number of potatoes are cut by using the plough, as with the hoe.

In putting up my potatoes, I have, for the last fifteen years, given the decided preference to the *cellars*, over the common mode of *banking*. The advantages of the cellars over the banks, are,

1. They require less labor to make them.
2. Consume none of your corn-stalks or pine trash in putting up the potatoes, which could be otherwise used as manure.
3. By proper management, keep the potatoes much better.

In a few days, with a few rails, a cellar might be made, capable of holding six or seven hundred bushels of potatoes. My mode of making these cellars is this: I select the driest and most sandy spot I can find—I ditch off a square about twice the size of the space required for the cellar, and dig one main ditch to lead off all the water from the ditches composing the square. I now frame my cellar with rails in the shape of the roof of a hipped-roof house, and cover the same with dirt as free from all vegetable matter as possible. I should here observe that the rails should be well dried before putting them up, and the earth with which you cover must have as little fermenting material in it as possible. At the end where you intend to fix the door of the cellar, you must project the roof over from two to three feet. This will keep it from too much exposure to the air, &c. Running through the entire length of the cellar at the top, you should have a trough with the uncovered side turned downwards, so as to let out the heated atmosphere within the cellar. The cellar should be double partitioned within, so as to leave a passage way through it. The potatoes should be placed on either side of the passage, and should the potatoes be dug, some in dry weather, and others in damp, the potatoes so dug, should be carefully divided and put by themselves. The reason of this is that the potatoes dug in dry weather will keep much longer than those dug in wet weather, and by mixing them the bad will injure the good.

Every day in dry weather, the cellar should be opened from about eleven o'clock, A. M. until one P. M. This will have a tendency to convey away the dampness of the potatoes, occasioned by their sweating. During a continuance of damp weather, the cellar should be smoked every one or two days. But care must be observed to make what is called a *dry smoke*. To do this, the fire used for creating the smoke should be made of the driest fuel. By pursuing the above mode, in putting up my potatoes, I have had them to keep throughout the entire year.

ST. PETER'S PARISH.

From the Southern Agriculturist.

GREEN RYE AS A MANURE FOR COTTON AND CORN.

Mr. Editor:—For some years back, I have been using green rye, listed in as a manure, for my cotton and corn. If the narration of my mode of doing it, will be of any benefit to your readers, I am willing that you should make it public.

Some time during the month of November, I run a trench upon the sides of the old cotton beds, with a small plough, which I have made for the express purpose. This plough is formed in the following manner: A billet of wood about four feet long is selected, and at each end a small trenching iron is fixed. To this billet, handles for the ploughman are attached; also a shaft to hitch the plough traces to. The trenching irons must be placed upon the billet about three feet and a half apart, so that when the plough is placed in the alley of the old cotton beds, they may be trenched on each side. With a plough of this kind, a light mule may trench many acres per day. In the trenches made as above, the rye must be sowed at the time already mentioned.

From being planted on the side of the bed, the rye will not be injured by the severe winter, because too much wet will not collect around the young plants.

Early in February I list in the rye, which has by this time pretty well grown up, and immediately after bed upon it. The rye will soon rot in this state, and will afford a fine manure for the cotton or corn plant, during the spring.

For several years back I have tried this experiment, and have found it a never failing resuscitator to worn out land. The first piece of land (six acres) I tried seven years ago. At that time it was miserably poor. By planting rye upon it, and ploughing it in green for two years running, I have been planting the field in cotton every year since, with the greatest advantage.

I have applied green rye to my corn with the same effect.

At another time, I shall perhaps give your readers some hints upon the application of green oats as a manure for potatoes. For the present, I remain your well wisher.

An Inhabitant of St. Bartholemews.

From the Southern Agriculturist.

NOTIONS ON THE MANAGEMENT OF NEGROES, &c.

1. *Cleanliness* is a matter which cannot be too closely attended to. Every owner should make it a rule to appoint a certain day in the week, for reviewing his negroes and their habitations, to see that both are clean and in good order. For myself, I select Sunday, as the best day for this purpose. My mode of making such reviews, is the following:

I appoint a certain hour for attending to this matter on each Sabbath, say nine o'clock in the morning. Every negro distinctly understands, that at this hour he will be reviewed. An hour or so previous to the review, I make it the business of the driver to sound the horn, for the negroes to prepare themselves and houses for inspection. When the hour for review has arrived, it is also his business to attend upon me, and report the plantation ready for inspection. This being done, I repair to the negro houses. At the door of each house, the occupants thereof are seen standing with their children, if they have any. My business here is to call their respective names, and to see that every one has had his head well combed and cleaned, and their faces, hands, and feet well washed. The men are required, in addition to this, to have themselves shaved. That they may have no excuse for neglecting this requirement, those that need them are provided with combs and razors. I now see that their blankets, and all other body and bed clothing, have been hung out to air, if the weather be fine. Their pots are also examined. I particularly see that they have been well cleaned, and that nothing like "caked hominy," or potatoes is suffered to remain about them. I next enter their houses, and there see that every thing has been cleansed—that their pails, dressers, tables, &c. have all been washed down—that their chimneys have been swept and the ashes therefrom removed to one general heap in the yard, which serves me as an excellent manure for my lands. Being situated where my negroes procure many oysters, I make them save the shells, which they place in one pile, of which I burn lime enough each year, to white-wash my negro houses, both outside and inside. This not only gives a neat appearance to the houses, but preserves the boards of the same, and destroys all vermin which might infest them. From the inspection of the negro houses, I proceed to their *well*, and there see that the water is pure and healthy.

I should here state, that I repeat on Sunday what I do every time that I see any of my negroes, viz. to examine that their clothes are not ragged or broken. Recollecting that a "stitch in time saves nine," I suffer none of them ever to appear with broken clothes. I give them the best clothes, and I see that they do not suffer them to be ruined from carelessness. In all of my inspections I have a little book, in which I note down every thing that I see amiss. The negro who has been the cause, is called up on the morrow, and receives such reprimand or punishment as his case may require.

Having mentioned their own duties, it will, perhaps, not be amiss to state what I owe them also. Exacting as I do, the utmost *cleanliness* of them, I particularly observe *cleanliness* in my own person. For instance, I never appear before my negroes unshaved, or negligently dressed, and every thing that I have to do, I do with as much punctuality and exactness as I am capable of. Ignorant minds are ever apt to imitate their superiors, and upon this principle it will be found, that if the master is negligent in the observance of his duties, the slaves will also become so.

2. *Diet.*—This is a matter of more importance than most planters are aware of. It is only necessary to inquire of the physician, or to consult any medical work, to be convinced that an improper

attention to diet, is one of the most prolific causes of disease among our negroes, as well as whites. It is the almost universal custom in this state, to give out to each negro a weekly allowance of corn or potatoes, and to suffer them to cook it as they please. For many reasons, this plan is the most agreeable to the negroes. I shall show, however, that it is far from being the most advantageous either to their health, or comfort. Every planter knows that there are many negroes, who rather than be at the trouble of cooking their own victuals, will trade away their allowance with their more industrious fellow-workers, for one-half; and even where this is not the case, they are always found ready to barter away their whole weekly allowance to some neighboring dram shop, for a gallon of whiskey, or a pound or two of tobacco, or bread. Where negroes are permitted to cook their own food, they neither have the time, nor capability to do it properly. It cannot be expected that the slave who is all day at hard work, can pay a proper attention to preparing his food after the day's labor. He generally comes home tired, and before he has half cooked his meal, hunger induces him to devour it. It is true that some negroes cook their food in the field, while at work, but even this mode, must at once strike every one as very improper. In nine cases out of ten, they cook with bad water, in dirty pots, and without salt. But I shall not enlarge upon the many ill effects arising from permitting negroes to have their allowance, and to cook it themselves. One of your correspondents, in a former number in an article on this subject, has pointed out many of the evils; I shall, therefore, detail a remedy which I have been applying for many years; and let me assure you, Mr. Editor, each year has caused me to be better pleased with its observance. First, then, when I give out corn as an allowance, I have it all ground into grist. And that this might be done with ease, I at first procured myself a corn mill worked by horse power, which, while it grinds and cracks all the corn on my plantation, only cost me a couple of hundred dollars. The corn being ground, I allow to each negro ten quarts of grist. Seven quarts of this I retain to be cooked for them, by a cook appointed for the purpose. The balance, three quarts, I give them to feed their poultry, or to do with, what they please. I have a person appointed to cook for all my negroes, who amount to about fifty in all. It is her business to prepare two meals per day; and for each meal she cooks a pint of grist to each grown hand, and in a smaller proportion for the younger negroes. That the food may be well done, she is required to cook in two or three distinct pots. Both for breakfast and dinner, I allow a small portion of meat of some kind, to boil with their food. And here let me observe, that a bit of meat, which when divided among them all, would not afford a taste for any one, will when cooked together, make soup enough to satisfy the whole plantation. In winter I require of the cook to have their breakfast ready at 8 o'clock, at which time the horn is sounded, and each negro comes with his piggin or bowl, and receives his portion, which is measured out to him by the driver. Dinner is required to be ready at 2 o'clock, and the same rules are observed as at breakfast. Since I have been cooking for the negroes of my plantation, I have never known one of them to complain of not having enough to eat. When I first adopted this rule, my negroes objected to it very much. But in a year or so they saw the utility of the practice, and now I am convinced, that they would not abandon it for a great deal, so much does it contribute to their comfort and health.

Little Negroes.

I have a nurse appointed to superintend all my little negroes, and a nursery built for them. If they are left to be protected by their parents, they will most assuredly be neglected. I have known parents take out an allowance for their children, and actually steal it from them, to purchase articles at some shop. Besides, when they would be honest to their offspring, from their other occupations, they have not the time to attend to them properly. The children get their food irregularly, and when they do get it, it is only half done. They are suffered, by not having one to attend to them, to expose themselves; and hence many of the deaths which occur on our plantations.

I have just stated that I have a nursery for my little negroes, with an old woman or nurse to superintend and cook for them, and to see that their clothes and bedding are well attended to. She makes the little ones, generally speaking, both girls and boys, mend and wash their own clothes, and do many other little matters, such as collecting litter for manure, &c. In this they take great pleasure, and it has the tendency to bring them up to industrious habits. The nurse also cooks for them three times a day; and she always has some little meat to dress for them, or the clabber or sour milk from the dairy to mix with their food. In *sickness* she sees that they are well attended to; and from having many of them together, one is taught to wait upon the other. My little negroes are consequently very healthy; and from pursuing the plan I have laid down, I am confident that I raise more of them, than where a different system is followed.

A PLANTER.

(*To be continued.*)

From the London Journal of Arts, for August.

DR. CHURCH'S STEAM COACH.

We have much pleasure in stating that Dr. Church has at length completely and satisfactorily accomplished the construction of a steam carriage, in every way suited to run on ordinary roads.

The external appearance of the carriage is made exactly to resemble a stage-coach, and is about the same dimensions. It consists of a frame work with a casing enclosing the boiler and engines; the furnace, fuel-box, water chamber, and condenser, all of which hang upon springs, supported by the running wheels, require no auxiliary tender.

The casing is formed and painted like an ordinary stage-coach; the conductor sits, for the purpose of steering, in the place of a coachman, on the box in front; the engineer, who attends the fire and the machinery, and has command of the steam, stands also in front, in an open compartment, below the conductor.

There are seats for the persons on the roof before and behind, as in other stage-coaches; but as this carriage is intended merely to be the locomotive engine for impelling a train of carriages connected to it, the seats upon this are to be considered as of an inferior class.

Some of the most important features of the locomotive carriage as now completed, viz. the peculiar construction of the boiler and arrangement of the working parts of the machinery, form portions of the subject of a patent granted to Dr. Church, on the 16th March, 1835; the specification of which, embracing other matters, is too elaborate for insertion in our present number, but will most probably appear in our next.

As several partially successful, but, in our opinion, very unsatisfactory attempts have been made by other persons, to impel carriages on ordinary roads by steam power, we consider it necessary to point out some of the peculiarities in Dr. Church's present carriage, which we consider to be its striking features of advantages. Firstly, though the engines work at high pressure, the eduction of steam is so effectually condensed after passing from the working cylinder, that no visible portion of it escapes into the air, but the whole is converted into water, and re-conducted into the boiler in a heated state. Secondly, the flues are so constructed and arranged, that no smoke is allowed to escape from the chimney; and the consequences of these two novel features, as regards locomotive engines running on ordinary roads, are very important, viz. that neither is there any perceptible noise arising from the discharge of steam, or any offensive effluvia emitted from the combustion, so that the carriage proceeds along the road without, in the slightest degree, attracting the attention of horses which may pass it.

We have only space to say further, that the Birmingham and London Steam-carriage Company, with whom the Doctor is connected in this invention, are perfectly satisfied with the carriage as now completed; and though alterations and slight improvements may and will necessarily be adopted in the future exercise of the plans, yet they deem the present carriage to be so fully effective and satisfactory, that they have advertised for a practical engineer to superintend the erection of a sufficient number of these carriages at their works, exactly according with the model produced.

We understand it to be the intention of the company to establish three stations between London and Birmingham for their trains of carriages to halt at, and to supply a fresh locomotive engine at each station, in order that the engines, after running about twenty-six miles, may be severally examined, and such little matters as cleaning, oiling, and adjusting parts, attended to: which arrangement will avoid subjecting passengers to the inconvenience of delay, and tend greatly to prevent accidents.

We have only to add, that having witnessed the manner in which this carriage performs its duty on the public road, we have no hesitation in saying that we are now satisfied that steam may be safely, and, we believe, economically employed, in connection with Dr. Church's improved machinery, as an effective substitute for horses, in the ordinary transit of stage-coach passengers on all the turnpike roads in the kingdom.

From the Cultivator.

MEMORANDA, FOR THOSE WHO WOULD IMPROVE IN HUSBANDRY.

Draining, *manuring*, *alternating crops*, and *root culture*, are the best and cheapest means of increasing the profits of a tillage farm—they form the basis of good husbandry.

1. *Draining*—The first requisite to divest a soil of surplus moisture. Lands that are wet upon the soil, or sub-soil, will not bring good grain or grass. If the evil is owing to surface water, it stagnates in summer, and becomes prejudicial to crops growing upon it, and to animals. If it proceeds from springs, it keeps the temperature of the soil too low for healthy vegetation. In either case it prevents the land being worked early, or during wet seasons, and retards the decomposition of the vegetable matters, which should serve as the food of plants. When properly drained, wet or marshy lands are among the most productive soils, as they generally abound in vegetable matter, accumulated and preserved by water. Without draining, they are comparatively unproductive, and are often nuisances.

2. *Manures* are the true food of plants, be the speculations of theorists what they may. Every farmer may demonstrate this truth in his practice. We can no more obtain good crops from a poor soil, than we can obtain good beef from a lean pasture. Vegetable matters constitute alike the raw material for beef and for corn. The elementary matters of both are materially the same. Every vegetable and every animal substance, or whatever has been such, however nauseous and offensive, contains food for our farm crops; and the fertility of our soil, and the profits of our husbandry, will depend in a great measure upon the economy with which we husband this vegetable food, and the judgment with which we apply it to our crops. Without good crops we cannot rear good animals; and without animals we cannot have dung to enrich our grounds. Every crop we take from a field serves more or less to exhaust the soil of fertility; and unless we return to it some equivalent in the form of manure, it will in time become a barren waste. Again, as animal and vegetable matters begin to ferment, and to dissipate their fertilizing properties, as soon as they are brought in contact with heat, moisture and air, they should be buried in the soil in the spring at farthest, in an incipient state of fermentation. And as the hoed crops, such as corn, potatoes, beans, ruta, baga, &c. thrive best upon the volatile parts of manure, the long manure should be fed to them The farmer who has a good soil should take care to keep it good; and he who has a poor soil should strive constantly to make it better, as every advance he makes in improving it, increases his productive capital. This preservation, or increase of fertility, cannot be well effected, without a due regard to

3. *Alternating Crops*. Few soils will bear a repetition of the same crop for successive years, even with the aid of dung, without diminution of product, whether in tillage or grass. One reason of this is, that each kind of crop takes from the soil a specific food, which other kinds do not take in like quantity. Hence, during an intermission of four or five years, there is ordinarily restored to

the soil the specific food of that kind which it is capable of growing. Cultivated crops are sometimes grouped, in alternate husbandry, in three classes, viz. dry crops, embracing all the small grains, and which are most exhausting; 2d, grass crops, embracing timothy, orchard grass and other perennial varieties, which exhaust less, but which run out, or sensibly diminish in product, in a few years; and 3d, green crops, comprising clover, turnips, &c., which pulverize and ameliorate the soil, and exhaust least of all. Where convenient, a crop of one of each of these classes should follow in succession, the grass continuing to occupy the ground while it continues to yield a good crop of hay. If retained too long in grass, the soil becomes too compact, and impervious to the genial influences of heat and air. It is particularly recommended, that two dry crops should not succeed each other, except wheat or rye may follow oats, when the latter is made a fallow crop upon an old grass ley. Although the deterioration under a bad system of cropping may be slow, and almost imperceptible, yet both science and experience teach us that it is inevitable, and fatal to the ultimate hopes of the husbandman. Many of the old states afford lamentable evidence of this truth.

4. *Root Culture* is one of the best gifts which modern improvement has bestowed upon husbandry. It gives the most animal food with the least labor; it is, under good management, the most certain in its returns; it gives the most manure; it best ameliorates the soil, and fits it for dry crops; and it affords an important link in the chain of alternation. It is considered the basis of good husbandry in Great Britain, Flanders, Germany and France, and has transformed the county of Norfolk from a waste to the most profitable district in England. Highly as the beet culture is prized in France, as affording a material for the profitable fabrication of sugar, it is no less valued as an alternating root crop, and as affording a material for making good beef and good mutton. The roots that may enter extensively into our husbandry, are the potatoe, (and the varieties of these that are best for table, afford the most nutriment to cattle) ruta baga, mangold wurtzel, carrot, parsnip and sugar beet.

As subsidiary to the preceding cardinal points in good farming, we give the following, which, although they may appear to many to be hackneyed truisms, are nevertheless so important as to be worth often repeating.

5. *Keep* none but good farm stock, whether as regards breeds or individuals. Sell the worst of your flocks. Like produces like; and the gain in breeding from the best you have, greatly counterbalances the extra price that the prime individual will bring in the market. A cow that gives eighteen quarts of milk per day in June, costs no more in her keep, than one that gives but six quarts; yet the product of the first is three-fold, and the profits four-fold, those of the latter. The fleece of the Saxon or Merino sheep is twice as valuable as that of the common one, though the cost of keeping them is equal. And the same corn that will make 100 lbs. of pork upon a long-legged, long-snouted, razor-backed hog, will put 150 or 200 lbs. upon the frame of a Berkshire or other improved breed.

6. Keep your farm stock well. A certain quantity of food must be given to keep them alive, all beyond this goes to increase growth, or is converted into meat, or milk, or wool; and if a little extra food is in this way profitable, much must be proportionably more so, for the more food you thus convert, the greater your return in labor, flesh and milk.

7. Cultivate no more land than you can improve, with a reasonable certainty of handsome net profit, embracing in the items of expenditure the interests on its value, fences, taxes, manure and labor. The good farmer, who raises 80 bushels of corn on one acre of land, clears the price of 50 bushels, which at 50 cents the bushel, is $25. The poor farmer, who cultivates *four* acres of corn, and gets 30 bushels on an acre, barely gets compensated for his labor and expense. We estimate the expense of raising and harvesting an acre of corn at $15, or the price of 30 bushels of the grain.

8. Buy good implements and tools, though they cost more than poor ones, and always keep them in repair for use. A good plough is drawn with half the team that a bad one is, and does the work twice as well, provided the ploughman knows how to use it. One good ploughing is better than two bad ones. Hence the farmer is soon compensated for the additional cost of the good article. The same remark holds good in regard to other implements and tools of the farm. In row culture, the cultivator will pay for itself in a season, in the economy of labor; the straw cutter will do the like in economizing fodder, and the drill barrow is a subject of equal economy in root culture.

9. We hardly need admonish the reader to use none but clean good seed; for every man knows that he will reap only what he sows—the cheat controversy to the contrary notwithstanding.

10. And lastly, we should disregard our duty, did we not press upon the consideration of every farmer the importance of agricultural publications, as the cheapest and most certain means of improving in the practice and profits of his business. These bring to his notice constantly the improvements and discoveries that are going on in the business of agriculture, and they detail the practice of the best farmers of our country. He that does not keep pace with the improvements of the day, in husbandry, as in other arts, cannot long find pleasure or profit in his employment. Those who stand still and content themselves with the practice of their fathers, will soon find that the business, active world, have all gone ahead of them. But we urge this matter particularly as an efficient means of instructing and qualifying the young for the duties of mature years—of stimulating them to acquire useful knowledge, and that confidence and self-respect which should ever characterize the yeomanry of a free country. The seed must be sown, and the mind be nurtured in the youth, if we would expect a harvest of respectability and usefulness in the man.

From the Cultivator.

PENNSYLVANIA HUSBANDRY.

Earthing Potatoes.—A very intelligent farmer from the valley of the Susquehannah, Union co., Pa. has stated to us verbally, some of the agricultural practices which prevail in his neighborhood, and which he is confident may be adopted with profit by others. One of these is raising potatoes without earthing. For this crop a young clover ley is preferred. The manure is drawn out and spread as the ground is ploughed, the potatoe sets are dropped in every third furrow, and of course covered with the next furrow slice. The ground is afterwards harrowed, and the crop kept free from weeds, by the harrow or cultivator, and hoe, *but the plants are not earthed.* The plough is only used in gathering the crop. Another mode is to draw shallow furrows, at the distance intended for drills, drop the seed, and cover by gathering two furrows upon the seed. The intermediate spaces are ploughed when the crop is first dressed, and turned in equal parts towards the two adjoining drills. The soil a sandy loam.

We have practised the first mode, except that our crop was earthed with a plough; and we are persuaded, that had we left a plane surface, the crop would have been benefited—for three reasons: first, because by earthing with the plough the seed was too deep, 10 or 12 inches, and could not receive the genial influence of heat and air; second, because the crop suffered more from drought in consequence of the sharp ridges into which the surface had been moulded, than it would if the surface had been left flat; and third, because the plough, by throwing a portion of the manure and sod to the surface, diminished the fertility of the ground. Our ground was partly in a moist swale, and partly on a sandy knoll. The crop in the swale gave at the rate of more than 600 bushels to the acre product; while that on the knoll, a severe drought having intervened, gave less than 300 bushels. The whole was highly manured. From this experiment, we infer, that in damp and stiff soils, it will be best to deposite the seed near the surface, and to earth the plants with the plough; and that where the soil is light and dry, the seed should be planted deeper, and the plants not earthed. By earthing the plants, it will be perceived, that double the surface is exposed to the drying influence of the sun, that there is where the ground is left flat. Ridges correct the defects of a wet soil, and they increase the evils of drought on a dry one.

Clover.—The practice, says our informant, is to mow clover only one year, as cattle food, and then to turn it under as food for the crop—thus ensuring the return to the soil of a mass of rich vegetable matter. Clover is a biennial plant, and of course cannot be depended upon as a *green crop* after the second year; and as this there constitutes the main dependance for winter forage, the timothy not being grown, it cannot be depended on, after the second year, *for hay.* Hence clover is not only sown with small grains, but in the Indian corn grounds, at the last dressing of the crop—the corn not being hilled. The latter practice is found highly advantageous, and is being extended.

We can add our own experience in favor of sowing clover with small grains. It is our general practice; and we find we are doubly paid in the autumn feed, and quadruply paid in the feed and the manure which the green crop returns to the soil. The clover not only imparts fertility, when turned under, but its roots divide and break the soil while growing, and render it pulverous as they decay. In sowing clover designed for a green crop, and indeed in all cases where it is to constitute the only herbage, at least ten pounds of seed should be used on the acre. The thicker the plants the finer and better the herbage; the more abundant the roots, the greater benefit to the soil, both as it regards pulverization and fertility. With regard to the utility of seeding corn fields, the only doubt we have, is, whether the clover would acquire sufficient strength to withstand our northern winters. As it would be sown in July, about the time we put in our ruta baga, we are inclined to think it would acquire sufficient maturity. While on the subject of clover, we will state our belief, resulting from experience, that it may be profitably grown on stiff soils and marsh land, providing they have been sufficiently underdrained—the only impediment to its growth on such soils being water upon the soil, or sub-soil, within the reach of the roots.

Sheep in Corn.—Our informant states it to be a good practice to *turn sheep into the corn fields*, after the last hoeing in July. They will not eat or injure the corn, but will eat the grass which springs up. The corn affords the shelter which those animals require, and serves to protect them from the fly, which is vexatious, and often seriously prejudicial to them, during the hot weather of August. But for the high respectibility of our informant, we should be disposed to doubt the utility of this practice.

Liming.—The use of lime for agricultural purposes in the valley of the Susquehannah, between the Blue Ridge and the Alleghany, where our informant resides, is of recent introduction, but it is found highly efficacious, and is increasing. The common application on the alluvial flats is fifty bushels the acre. As lime-stone abounds in the neighborhood, it is sold at the kilns at ten cents the bushel. It is burnt with anthracite coal, which is there bought at two dollars the ton. The process of burning is cheap and simple. A hole is excavated in the side of a hill, in the shape of an inverted cone, with an open passage from the base of the pit to the base of the hill, by which to ignite the coal when the kiln is filled. The pit is then filled with broken limestone, and broken anthracite, intermixed; the top is well covered with sods and earth, and fire communicated below. No attendance upon the kiln is required, and in about eight days the lime may be drawn for use.

Ascending the valley of the Susquehannah, and above the Alleghany range, we meet with no limestone till we pass some distance into the state of New York. Hence this material, as soon as the facilities of water communication, which are begun, shall be completed, must form a prominent article of export from our state into the upper valley of the Susquehannah. The application of lime to the red sand stone formation is found to be particularly serviceable. As this formation extends, with partial exceptions, from the Connecticut river to North Carolina, the publication of this fact may excite new attention to the subject. If our recollection serves us, this formation shows itself, according to Professor M'Clure's geological map, twenty or thirty miles on Connecticut river, is seen to underlay the Pallisado rocks upon the west bank of the Hudson, emerges to the surface near New Brunswick, and occupies a district twenty to thirty miles broad, through West New Jersey, Pennsylvania, Virginia, &c.

From the 3d vol. of Memoirs of the Board of Agriculture of the state of New York.

ON THE USE OF LIME IN AGRICULTURE.

Lime has been long and profitably used in some of the counties of Pennsylvania, in the business of husbandry. It has stood the test of experience, and many farmers who had abstained from its use, on the introduction of gypsum, are again resorting to it, we are told, as the cheapest and surest means of increasing fertility to the soil. We believe that, on trial, its use will be found no less beneficial in New York than it has proved in Pennsylvania, and in Great Britain. At all events, as lime exists in great abundance in most of our counties, it is of importance that the question should be settled by careful and repeated experiments.

The importance of the subject induced us to write to Pennsylvania, for such informations as might serve to guide us in the application of this useful fossil for the improvement of our farms. The two letters which follow have been received in reply to our inquiries. They come from practical farmers—and although the information which they contain is not so full as we wished, it is nevertheless sufficient, we hope, to induce the enterprizing cultivators of our state to give the subject a fair experiment.

It may not be amiss to state the qualities of the Pennsylvania lime-stone, and to remark, that we shall endeavor to obtain an analysis of specimens of our own state; which, if we obtain in time, shall be inserted in a subsequent page of this volume. Professor (now President) Cooper examined specimens of the former, obtained from nine different localities. The results of the analyses were as follows:—

	Pure lime.	Silex.	Alumina.	Carb. of Mag.
No. 1—100 parts gave	83	3	2	12
2 ,, ,,	81	3	2	14
3 ,, ,,	80	4	2	14
4 ,, ,,	76	4	6	14
5 ,, ,,	81	5	2	12
6 ,, ,,	82	2	0	16
7 ,, ,,	85	1	0	14
8 ,, ,,	85	1	0	14
9 ,, ,,	54	36	6	4

Of these, No. 7 is regarded as the strongest for building or for land, and No. 9 the weakest. The first four are strong lime—five and six of medium quality, and No. 8 nearly equal to No. 7: that is according to their reputation in the neighborhood.* Magnesia, in the proportions indicated in the foregoing results, is not prejudicial to vegetation;—though a greater proportion (22 per cent.) has, according to Tennant, been found injurious in Great Britain.

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Letter from Cyrus Jacobs, Esq. dated Spring Grove Forge, Nov. 8, 1824.

J. Buel, Esq.

Dear Sir—In answer to your queries about lime, I have to inform you that, until within the last two or three years, it was but little used as a manure in this neighborhood; it is now more used, and on all soils; some farmers put on first, from thirty to forty bushels per acre, and in two or three years afterwards, about the same quantity; the general opinion is here, it operates on corn and clover the soonest. It is put on the land in different ways here; but generally the land is first ploughed, and the lime hauled out of the kiln before it has slacked, and put on in about one bushel in a heap; and as soon as it is slacked, spread immediately, and harrowed twice over and then ploughed in; and in dry weather it often happens that we have to haul water to slack it. Others have the ground all ready for seeding, and haul the lime and put it on the same way, and as soon as slacked, spread it and harrow it twice over, and then sow the seed and harrow it twice over again, which mixes it very well and keeps it near the surface of the ground: this method I think the best; both the above methods are here used. I have had put on my land this season between *seventeen and eighteen thousand bushels* of lime, and have put it on in both the above ways, and have not put on less than sixty or seventy bushels per acre, nor more than one hundred. I have no hesitation in saying, that I have experienced fifty per cent. benefit in corn and grass; in our wheat crops I cannot yet so well judge the benefit, not having limed my land more than two years past, but have not the least doubt but I shall be amply repaid for all the cost and trouble of the lime. Our lands here are nearly all limestone land, and of a good quality, and will bear more lime than land of a poorer quality; but it is the general opinion that the poorer soils agree best with lime, and receive the most benefit from it; and no doubt it is the case. Some are of the opinion that limestone land is not much benefited with lime, particularly for wheat crops, though that is not my opinion; and should I be spared a few years, I shall be better able to judge, as I have, for these last two years, been liming my land on a tolerably large scale; and have not the least doubt but I shall be fully recompensed for it, both in my wheat crops and other grain; in corn we have already experienced the profit.

I remain, dear sir, very respectfully, your humble servant,

CYRUS JACOBS.

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Letter from Daniel Buckley, Esq. dated Salisbury, Pa. Dec. 19, 1824.

J. Buel, Esq.

Dear Sir—I received your favor of the 16th November, requesting information as to the effects of lime upon various soils, the methods of application, its duration as a manure, on what crops most immediately useful, and on what remotely, the quantity applied, and at what intervals repeated, the price, &c. A want of confidence in my ability to answer these queries suitably, will compel me to confine my remarks principally to the sphere of my practice and personal observation.

The land which I cultivate, according to M'Clure's treatise, is transition, composed of white and yellow clay and lime-stone, much of the latter appearing on the surface, intermixed with flint. Upon this soil I have made a liberal use of lime ever since the year 1790, and think I have been well rewarded for the expense and labor, by the increased value of my crops.

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* See Memoirs of the Philadelphia Agricultural Society, Vol. 3, p. 106 of Appendix.

The method of applying the lime, which I have adopted in common with my neighbors is, in the first place, to plough up a sod field with a strong team, in the spring or fall, harrow it the way it is ploughed, and mark the field into as many squares as you intend to put on half-bushels, say 100 on the acre, which will bring the furrows about 20 feet apart each way, and require 50 bushels to the acre. This quantity I have found to be most profitable. When the lime is burnt, and as soon as it is cool enough to handle, it ought to be hauled on the land already marked, and a half-bushel deposited in the centre of each square, in as compact a heap as possible. If water is convenient, I prefer to slack the lime immediately, rather than to wait for rain, as it becomes finer and can be more evenly spread. As soon as it has slacked, it is immediately spread and well harrowed. This method I prefer for Indian corn, barley, oats, rye and potatoes. On all the above crops I have experienced a great benefit from lime the first year after its application. With potatoes I add about 15 two-horse loads of barn-yard manure to the acre, before planting. A second liming is often given, and much approved of, after an interval of three or more years. This amalgamates better, and can be more intimately mixed with the soil.

There are good farmers who differ as to the quantity of lime that is most profitably applied. Some say 60 bushels on the acre, some 70, and some more. I have applied 100 on an acre of limestone land, at a dressing, but have not been able to discover any benefit from using it thus freely, nor any injury, except in the loss of lime.

Wheat seldom receives any benefit from lime until the second or third year after it has been applied, except it has been mixed in a compost of yard manure and earth. This method is much practised in the lower counties of this state; though not by good farmers until they have applied lime as the basis of amelioration. By this management they have raised their lands from an impoverished state, produced by injudicious cropping, to such a state of fertility, as, I am informed, to enable them to fatten a bullock of six hundred weight on an acre, and to cut grass from the same acre sufficient to winter another.

Sandy soils are greatly improved by the use of lime. I lately purchased some of that kind, which was originally covered with chestnut timber, and was called mountain land. It had been cleared seventy years; but lying a distance from the farm buildings, had never received manure but a dressing of lime. This land I have had repeatedly farmed since I owned it; and although to appearance it seemed to be almost a *caput mortuum*, with the aid of ten or twelve four-horse loads of the gleanings of a yard of a public house, it has produced as much, and as good wheat, rye, oats, timothy and clover to the acre, as any land in the township in which it lays. I consider the liming which it had fifty years ago as the principal cause of its fertility.

It is a general opinion amongst good farmers, that liming should be repeated every ten or fifteen years, and that the increased crops richly compensate the expense. It matters very little how it is applied, provided it is evenly spread immediately after it is slacked. If suffered to air-slack, or to lie after it has been water-slacked, it re-imbibes carbonic acid, which the fire had expelled, becomes lumpy, and is more difficult to be incorporated with the soil. Some spread it upon the sod, and plough it under, and think they have as much profit from it in this way as in any other. When thus applied, it powerfully contributes to decompose the tougher fibres of the sod, and to convert them into nutriment for the crop.

The price of the lime is governed by the price of wood, the distance the stone has to be transported, the construction of the kiln, and the experience of those who burn it. Where wood costs but one dollar a cord at the kiln, where the stone has to be carted not more than the fourth of a mile, the kiln well constructed, to contain 800 or 1,000 bushels, and the workmen understand their business—the lime can be sold at eight dollars the hundred bushels at the lime-kiln, and leave to all concerned a fair compensation for their labor and expense. I have paid 25 dollars per hundred bushels, delivered on the field, at ten miles distant from the lime-kiln, and think I could not have applied my money to better advantage. This was applied to land of the old red-stone formation. The produce has far exceeded my expectation. I however make use of barn-yard manure and plaster of Paris; the former at the rate of ten four-horse loads the acre; and the latter at the rate of a bushel and a half, on rye, timothy and clover. Yet I consider lime as the *real mother* of all the sweet grasses.

I am with sentiments of esteem, your obedient servant,

DANIEL BUCKLEY.

P. S. I have omitted to state, that on land which has been much exhausted, or has naturally a thin soil, we do not apply more than 30 or 40 bushels to the acre, at the first dressings; but in three or four years afterwards the liming may be repeated to advantage, to the extent of fifty bushels on the acre.

D. B.

Letter from William Chapman on the use of lime in Agriculture.

Sir—Agreeably to your request, I now communicate to you my experience in the use of lime in husbandry.

First.—While with my father in England, I assisted to set out large quantities of lime as a manure. It was applied to all soils upon his farm, viz: moss or turf, clay, black or yellow loam, and sand loam. We put on from two to three hundred bushels the acre. I have seen land that before liming was so poor that it would bear nothing but bent and moss, after liming, give the heaviest crops of oats and wheat for ten years; and I have no doubt it would have produced good crops for ten years longer, with suitable alteration of grasses.

Second.—I have set out lime on my farm in this country, on stiff clay and on loams, in considerable quantities. It has been particularly beneficial on the clay. I had one field which would produce nothing of consequence until I limed it; after which I sowed it with rye and grass seeds. Both the grain and grass were good, and it is now covered with a fine rich sward. I have used lime for several years, and my confidence in its benefits have not at all been diminished.

Third.—I am satisfied that lime is a preventive of smut in wheat, rye, oats and barley, if the seed, previous to sowing, is steeped in brine or lime water, and rolled in fresh-slacked lime. And I am equally satisfied it will destroy the insect, or Hessian Fly, in the young grain, if sown in the morning when there is a heavy dew on the crop. Some years ago I sowed some spring wheat, and as I had no salt at my farm to make brine, I took stone lime, and slacked it in a tub of water; and when the water was as warm as I could bear my hand in, I put in the seed, skimmed off the light matters which floated, and continued stirring the grain for half an hour or more. The grain was then sown; and when it came into its third or fourth leaf, although it looked well, I sowed fresh-slacked lime over the field while the dew was upon it. The crop was very good—while all my neighbors, except one, lost almost their entire crop of spring wheat. This one happened to be passing while I was sowing the lime on my young grain, and at my suggestion, went home and sowed it upon his own also, and, I understand, had a good crop.

In the spring of 1823, I had about three acres of winter wheat, a portion of which looked very yellow when the snow went off. I directed this to be sown with lime; but on visiting my farm two weeks afterwards, I found it had not been done, and that the whole field assumed a like yellow appearance. I had the whole immediately sown with lime; the grain immediately improved in appearance, and I had a tolerable crop, though not so good, I think, as I should have had if the lime had been sown two weeks earlier.

Mr. Ebenezer Cady, of Duanesburgh, at my suggestion, adopted my method last spring, of steeping his seed, rolling it in lime, and sowing fresh-slacked lime upon his young grain. The experiment was so successful, that this wheat was considered the best in the country.

Fifth.—I have applied lime successfully upon cucumbers, and other garden vines, to protect them from the yellow bug; taking care to repeat it as often as the wind or rain blew or washed off that which had been before applied. Half a bushel of lime, mixed with the earth of an ant-hill, will effectually destroy a colony of these insects.

Your friend,

WILLIAM CHAPMAN.

Albany, January 6, 1825.

From the Encyclopedia of Agriculture.

CHARACTERISTICS OF FLEMISH HUSBANDRY.

To make a farm resemble a garden as nearly as possible, was their principal idea of husbandry.—Such an excellent principle, at first setting out, led them, of course to undertake the culture of small estates only, which they kept free from weeds, continually turning the ground and manuring it plentifully and judiciously. Having thus brought the soil to a just degree of cleanliness, health and sweetness, they ventured chiefly upon the culture of the more delicate grasses, as the surest means of acquiring wealth in husbandry, upon a small scale, without the expense of keeping many draught horses or servants. After a few years experience, they soon found that ten acres of the best vegetables for feeding cattle, properly cultivated, would maintain a larger stock of grazing animals, than forty acres of common farm grass: and the vegetables they chiefly cultivated for this purpose were lucerne, sainfoin, trefoils of most denominations, sweet fenu-greek, (*Trigonella,*) buck and cow wheat, (*Melampyrum pratense,*) field turnips and spurry, (*Spergula,*) by them called marian-grass.

The political secret of Flemish husbandry was, the letting farms on improvement. Add to this, they discovered eight or ten new sorts of manures. They were the first among the moderns who ploughed in living crops, for the sake of fertilizing the earth, and confined their sheep at night in large sheds built on purpose, whose floor was covered with sand, or earth, &c. which the shepherd carted away every morning to the compost dung hill. Such was the chief mystery of the Flemish husbandry.

Urine cisterns are formed in the fields, to receive purchased liquid manure; but for that made in the farm-yard, generally in the yard, or under the stables. In the latter case, the urine is conducted from each stall to a common grating, through which it descends into the vault; from thence it is taken up by a pump. In the best regulated farmeries there is a partition in the cistern, with a valve to admit the contents of the first space into the second, to be preserved there free, from the more recent acquisition, age adding considerably to its efficacy. This species of manure is relied on beyond any other, upon all the light soils throughout Flanders, and even upon the strong lands, (originally so rich as to preclude the necessity of manure,) is now coming into great esteem, being considered applicable to most crops and to all the varieties of soils.

Fallows, according to Sir John Sinclair, are in a great measure abolished, even on strong land; by means of which, produce is increased, and the expense of cultivation on the crops raised in the course of a rotation, necessarily diminished: and by the great profit they derive from ther flax and rape, or coleseed, they can afford to sell all their crops of grain at a lower rate. Notwithstanding this assertion of Sir John, it will be found that a fallow enters into the rotation on all the clayey soils of Flanders.

Flax is cultivated with the utmost care. The field intended for this crop, after two or three ploughings and harrowings, is again ploughed, commencing in the centre and ploughed round and round to the circumference, so as to leave it without any furrow. The heavy roller is drawn across the ploughing by three horses; the liquid manure is then spread equally over the entire surface, and when well harrowed in, by eight or nine strokes of the harrow, the seed is sown, which is also harrowed in by a light harrow with wooden pins, of less than three inches; and the surface, to conclude the operation, is again carefully rolled.

Nothing can exceed the smoothness and cultivated appearance of fields thus accurately prepared.

The manure universally used for the flax crop, demands particular notice. It is termed liquid manure, and consists of the urine of cattle in which rape cake has been dissolved, and in which the *vidanges* conveyed from the privies of the adjoining towns and villages, have also been blended. This manure is gradually collected in subterraneous vaults of brick work, at the verge of the farm next to the main road. Those receptacles are generally forty feet long by fourteen wide, and seven or eight feet deep; and in some cases are contrived with the crown of the arch so much below the surface of the ground, as to admit the plough to work over it. An aperture is left in the side, through which the manure is received from the cart by means of a shoot or trough, and at one end an opening is left to bring it up again, by means of a temporary pump which delivers it either into carts or tonneaus.

The liquid is carried to the field in sheets or barrels, according to the distance. Where the cart plies, the manure is carried in a great sheet called a *voile*, closed at the corners by running strings, and secured to the four uprights of the carts; two men, standing one on each side of the cart, scatter it with hollow shovels upon the rolled ground: or where the tonneaus are made use of, each is carried by two men with poles, and set down at equal intervals across the field, in the line of the rolling.

There are two sets of vessels, which enable the men who deposite the loaded ones, to bring back the others empty. One man to each vessel, with a scoop or rather a kind of bowl with a long handle, spreads the manure so as to cover a certain space; and thus by preserving the intervals correctly, they can precisely gauge the quantity for a given extent of surface. For the flax crop they are profuse, and of this liquid mixture, in this part of the country, they usually allow at the rate of 2480 gallons, beer measure, to the English acre.

With culinary vegetables the Flemish markets are abundantly supplied. Most of these are grown by the small farmers, and are of excellent quality. To every cottage in Flanders a garden of some description is attached; and according to the means, the leisure, and the skill of the possessor, is rendered more or less productive. The general principles of management with all are, frequent digging, careful weeding, ample manuring, and immediate succession. The rotation depends on circumstances. The chief vegetables in common use are parsnip, carrot, turnip, scorzonera, savoy, jettechou, cabbage, (Brussels sprouts,) onions, leeks, pease, beans, and all kinds of salading, with another vegetable called *fève haricot*, a large species of French bean, which has a place in the field or garden of almost every farmer; and being sliced down, pod and seed, is made a chief ingredient in all farm-house cookery.

The treatment of asparagus here, and generally in Flanders, differs considerably from our method: in forming their beds, they are not by any means particular as to very deep trenching, or a profusion of manure; nor, as they grow up, do they cover the beds with litter for the winter, nor fork and dress them in the spring; in the furrows they form a rich and mellow compost of earth and dung, with which before winter sets in, they dress up their beds to the height of nearly eighteen inches from the level of their crowns, and without any further operation, (except supplying the furrows again for the ensuing year,) as soon as the buds appear, they cut them nine inches under the surface; by which means, having just reached the light, the whole of the stock is blanched and tender.

Every substance that constitutes, or is convertible to manure is sought after with avidity, which accounts for the extreme cleanliness of the Flemish towns and pavements, hourly resorted to with brooms and barrows, as a source of profit. Even the chips which accumulate in the formation of shoes worn by the peasantry, are made to constitute a part of the compost dung heap; and trees are frequently cultivated in barren lands, merely to remain till their deciduous leaves shall in the course of time, have formed an artificial surface for the purpose of cultivation. The manures in general use are—

The farm-yard dung, which is a mixture of every matter that the farm-yard produces, formed into a compost, which consists of dung and litter from the stables, chaff, sweepings, straw, sludge, and rubbish, all collected into a hollow part of the yard, *so prepard as to prevent the juices from being wasted;* and the value of this, by the cart load of 1500 lbs. of Ghent, is estimated at five francs.

The dung of sheep, pigeons or poultry, by the cart load, five francs and a half.

Sweepings of streets and roads, same quantity, three francs.

Ashes of peat and wood mixed, same quantity, eight francs.

Privy manure and urine, same quantity, seven francs.

Lime, same quantity, twenty-four francs.

Rape cake, per hundred cakes, fifteen francs.

Gypsum, sea mud, and the sediments of canals, have been all tried experimentally, and with fair results; but the two former have been merely tried; the latter is used successfully in the vicinity of Burges.

Bone manure was altogether unknown in Flanders, but at the suggestion of Radcliff, is now under experiment in that country.

MALARIA OF MARSHES.

Substance of a paper read by M. Gaetano Giorgini, at the Academie Royal des Sciences, (Paris,) July 12, 1825, and recently published in the Annales de Chemie et de Physique.

M. Gaetano begins by observing, that man, better than any other organized being, adapts himself to all climates, living in the middle of the burning sands of Africa, as well as in the midst of the eternal ice of the polar regions. Nevertheless, he finds in the insalubrity of the air in some places causes of destruction, where the temperature and the fertility of the ground otherwise provide him with the means of happiness and opulence. The causes of this insalubrity are different, but the principal ones are, the bad quality of the water, the nature of the soil and its vegetable productions, the exhalations which arise from it, but, more frequently, the neighborhood of stagnant waters, and the nature of their sediment. These causes sometimes disappear as the country is cultivated, and life and health are preserved in districts before deserted and inhospitable. It is of great consequence, therefore, that the causes and causes of this insalubrity should be accurately known. Most generally, the insalubrity of the air is occasioned by the vicinity of stagnant water; but this cause is modified by a multitude of circumstances, often difficult to separate and distinguish. The neighborhood of marshes is not always unhealthy, and not always to the same degree. This is a truth which has long been known. Vitruvius, Silvius, Donat, Pringle, and Lancisi, have all remarked, that one of the principal causes of the unhealthiness of marsh lands is the overflowing of the fresh water marshes by the waters of the ocean, for a longer or a shorter period during the summer. It has been distinctly stated, that this was the cause of the terrible diseases so well known in Italy under the name of *malattie di cattiva aria*. As proof of this, the author refers to the salt marshes in the south of France, the marshes on the coasts of the Mediterranean, in the kingdom of Naples, in the Ecclesiastical States, and in Tuscany, the neighborhood of which, abhorred and depopulated, presents a striking contrast with the fertility and population of other provinces in the interior, situated near marshes of equal extent. But a more complete proof of this assertion will be found in the following interesting account:

On the south of the Ligurian Appenines, there is a marshy district, bounded on the west by the Mediterranean, and extending about twelve miles in this direction; on the south by the Serchio; on the east by the foot of the Appenines, and on the north by the Frigido—a torrent which rises nearly at the foot of the Appenines, on the estate of *Massa de Carrare*, and falls into the sea after a course of three or four Italian miles. The width of this plain from the sea to the foot of the mountains, on the east side, is between two and four miles. It is traversed from east to west by several rapid streams, rising in the mountains and losing themselves in the marshes, or discharging themselves into the sea. Including the Frigido and the Serchio, are those which discharge themselves in the rivers of Camajore, and of Pietra Santa or Finmetto. They have no communication with the marshes which they divide into three separate and distinct basins. The marshy plain, may be considered as having been formed by the sands brought down by the Arno and the Serchio into the gulph, which formerly extended to the foot of the mountains in the east. In fact the bottom of the marsh is sand, like that of the sea shore, which forms a sort of dyke, elevated a few feet only above the level of the sea, and rising from it very gradually. What renders this conjecture probable, is, that the deposites from the Arno and Serchio, are now continued, and increase the breadth of this dike four or five bracci every year, so that the sea appears to retire every year the same distance.

It may easily be comprehended how the Arno and Serchio, advancing their *embrouchure* further into the sea, and in the midst of the alluvial matter they bring down, have formed the sort of dike on the side which bounds the marshes of the lake of Massaciuccoli de la Torre and de Motrone, and of the lake de Perotto. Originally, it is probable these formed only one continued marsh, which was subsequently divided into the three basins mentioned above, by the alluvion of the Camajore and the Pietra Santa, which, like the Serchio and Frigido, have made themselves a course in the midst of the stones and vegetable matter they brought with them from the mountains, and with a layer of which, of greater or less thickness, they covered the neighboring plains. The small quantity of rain and spring water which runs or falls into these basins, is discharged slowly into the sea, either by natural or artificial channels, which pass through a dike of sand on the coast. Of these there are three; 1st, for the principal basin of the lake Massaciuccoli, the outlet of Barlamacca; 2d, for the lesser marshes and ponds of the plains of de la Torre and Motrone, the outlets of Motrone and Tonfala; 3d, for the small lake of Perotto, and for the marshes in the neighborhood, the outlet of Cinquala. The level of these several ditches, or sewers, is very little higher than the sea, during the ebb, and is lower than the level of the sea during the flood, though the rise and fall of the tides is very trifling in this part of the Mediterranean. Before the erection of the sluices, hereafter to be mentioned, the sea water, on the tide rising, or on the level of the ocean being elevated by any other cause, entered into these ditches, and forced back the noxious drains, and unless the streams were particularly swollen by rains, the sea water spreads itself over the basins, to the foot of the mountains, particularly during a "*libeciata*," or north-east wind, when the boisterous ocean rolled its waves far into the canals. The mixture of salt and fresh water which resulted, being slowly and seldom renewed, putrefied, and spread all around the most complete and the most murderous infection.

I shall not stop, says Mr. Giorgini, to describe the condition of the population in those parishes nearest to the marshes and to Viareggio, which was then only a collection of fishermen's huts, situated near an old tower, which the wisdom of that age, not philanthropic, had converted into a prison for those who were sent to the galleys. The effects of the *Malaria* are too well known that I should describe them. In the places I have mentioned they occurred every year, in all their horror. The natives, few in number, and perpetually attacked with diseases of the liver or the spleen, presented through the whole year, the afflicting spectacle of feeble and languishing children, of men barely convalescent, in the midst of whom age was unknown. At the close of the summer, they were attacked by more severe disorders; and those who were only attacked with intermittent fevers, which gave way at the approach of winter to repeated doses of bark, esteemed themselves happy. In vain the greater number of them fixed their dwelling on the hills, or in the interior, and only went into the plains for the indispensable labors of cultivation, thus seeking to escape the more deleterious influence of the night; fever and death followed them to their miserable abodes. Things were so bad, that the culture of the olive, with which the hills on the border are richly covered, was entirely done by strangers, who came during the winter to till a soil, the very fertility of which was an evil, for it served to lure fresh victims. If the natives themselves could not escape, woe to the stranger or the traveller who forgot his situation, and passed a single night, in the months of August or September, in these infectious countries. His death was certain. Such was the situation of the country before 1741, and I have described it without exaggeration, and from public documents.

As early as the year 1714, Gemignano Rondelli recommended a sluice and gates to separate the water of the ocean from the water of the marshes; but it was not till 1740 that this work was begun, at the outlet of Barlamacca, and in 1741 it was completed. Gates were constructed, the doors or valves of which opened outwards, and permitted the waters of the marshes to flow off, while they closed against the ingress of the ocean, and kept its water from entering. The year following the completion of this work, the *Malaria* did not appear either at Fiareggio, at Massaciuccoli, at Quiesa, or in the more distant parts of the basins of Motrone and Perotto. From that time, that part of the population, not wholly exhausted, was restored to health and vigor, and has ever since gone on increasing. Viareggio has grown to be a considerable town, and every suspicion of unhealthiness has so far disappeared, that the best families of the city of Lucca have built themselves villas and palaces at Viareggio, which they inhabit during the summer, to enjoy the salubrious sea breezes, and indulge in the pleasures of baths and society. If any doubt could remain as to the cause of this improvement, they would be removed by two unfortunate events. In the summer of 1768 and 1769, Viareggio, and the parishes near the lake Massaciuccoli, were again the prey of disease. In the former, out of 1330 souls, 170 died in these two years, making one in fifteen; while in the following year, the mortality was only one in forty. It was ascertained, that the cause of the mortality was, that the sluices had decayed, and had allowed the sea water to enter, in these two years; and after the injury had been repaired, the place became again healthy. In 1784 and 1785 the same neglect occurred, followed by the same consequences. Of 1898 inhabitants, one in twenty died in the year 1784; and in 1785, of 1834 persons, 103 fell victims to disease. In 1784 there were, according to reports presented to the government, 1200 sick persons out of the 1898 inhabitants of Viareggio. This epidemic also ceased as that of 1769, on the sluices being repaired.

After this experience, it was to be expected that similar works would be erected for the basins of Motrone, and for the lake of Perotto, but no! the unfortunate inhabitants of the plains of Camajore, of Pietra Santa, and particularly of Montignoso, a town which suffers remarkably from the influence of the marshes of Perotto, were destined to remain in this miserable condition, which was rendered more miserable by knowing that it might be so easily remedied. Some difficulties, it appears, were in the way of accomplishing so desirable an object, owing to the proximity of the two states of Lucca and Tuscany; and M. Giorgini bestows praise which is well merited, apparently, on the Chevalier Matteucci, sent as an envoy from Lucca, and afterwards as minister to Lucca, for his exertions in getting these difficulties removed. The business was agitated in 1804, and in 1808 the Chevalier recommended, till a sluice could be constructed at Cinquala, that the inhabitants of Montignoso should all be forcibly removed during the summer. His advice was followed, and in 1809, 1810, and 1811, the people were all forced to leave their wretched habitations, or rather tombs. In 1812, a sluice was completed at Cinquala, and from that time, the air of Montignoso has been as healthy as that of Viareggio. The salutary influence of this measure extended itself to the villages of Querceta, Pietra Santa, and Vallechia, though in less degree, towards the ponds of Motrone. To complete the work, it was necessary that sluices should be erected at Motrone and Tonfalo, and M. Matteucci having the charge of the principality under the provisional Austrian government, and not willing to leave the good work incomplete, employed his authority in aid of the determination taken by the municipalities of Camajore and Pietra Santa, to construct these two sluices at their expense. The one at Motrone was begun in 1818, and completed the following year, while the less important one at Tonfalo was not completed till 1821. Since that time, the diseases arising from malaria have ceased at all points, and there is no more danger of disease, except the sluices should be neglected, which the inhabitants ought to regard as their palladium.

M. Giorgini adds to his interesting account, some tables of the population of this once pestilential neighborhood, and proposes some questions as proper for inquiry by scientific men. Supposing that neither of these subjects would have much interest for our readers, we shall merely state the result of his tables. The population of the arondissement of Viareggio, in eleven parishes, which, in 1733, amounted to 1509; and in 1823, they amounted to 9408—so that in these ninety years, the population has doubled in 36 years. A similar increase has taken place in the other districts since the sluices have been erected, proving the utility of the measure, and exciting much surprise, after the success of the first experiment, that so many years should have elapsed before the whole was completed.

ACCOUNT OF THE BURSTING OF SOLWAY MOSS, AND THE FLOOD OF MIRE THENCE PROCEEDING.

[The following extract from the Scots Magazine, for Dec, 1771, describes a phenomenon which was most strange, if not unprecedented, in the region where it occurred, where peat-mosses cover a very large proportion of the whole country—and which, without explanation, would seem incomprehensible, if not incredible, in Virginia, where no such formation as peat or moss is found, or could long exist, it being the product only of northern regions, where the heat of summer is not sufficient to rot the annual accumulation of vegetable matter, from the natural growth of plants. Hence, and especially where continually supplied and saturated with water, the vegetable matter increases in thickness, and according to its age, degree of moisture, and other circumstances, the result is either the firm peat or turf, which is cut out for fuel, or of various other degrees of density and quality between that and the *flow moss*, or fluid mire, such as caused, by its overflow, the remarkable calamity described below. The mosses or bogs are often, if not generally, formed, as Solway Moss was, on higher lands than others in the neighborhood. Every year's growth of vegetable matter adds to the height of the solid materials—and the water received from rains and streams

is absorbed, as by a sponge, to its fullest power of retention. These causes concurred with the prodigious floods then prevailing in that part of Scotland to produce the actual moving off of so great a body of what had been before considered as permanent and fixed earth.]

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But the most extraordinary devastation occasioned by these floods was the eruption of Solway Moss in Cumberland. For the better understanding of which, we shall first give a description and draught of the spot of ground which was the scene of this remarkable event.

Along the side of the Esk there is a vale, about a mile broad, less or more in different places, almost a dead plain, allowing for some inconsiderable inequalities upon the surface. It is bounded on the south-east by the river Esk, and on the north-west by a steep bank, thirty feet in height above the level of the vale. From the top of the bank the ground rises by an easy ascent for about a quarter of a mile, where it is terminated by the moss; which extends about two miles north and south, and about a mile and an half east and west, and is bounded on the north-west side by the Sark. It is probable, that the solid ground from the top of the bank above the vale, is continued in the same direction under the moss for a considerable space; for the moss at the place where the eruption happened, appears inclined towards the sloping ground. From the edge of the moss, there was a gully, or hollow, called by the country-people *the gap*, and said to be thirty yards deep where it entered the vale; down which ran a small rill of water, which was often dry in summer, having no supply but what filtered from the moss. Another rill running from the north, which, after entering the gap, discharged itself into the Esk below Langtown, being now obstructed in its course by the mud, is formed into a loch* near the gap. The eruption happened at the head of the gap. The most distinct account of this eruption that we have seen, is a letter signed J. S. and dated *Solway Flow, Dec.* 13, viz.

"*Sir*—Curiosity led me to Solway Moss. As some circumstances struck me in a different light from other people, I could not help communicating my observations to the public.

The original moss, which contains about 1400 acres, was raised above all the circumjacent grounds, in some places three feet, and in other places as many yards. The surface of it in summer, was generally so firm and dry, that people could safely walk over the whole of it, and in some places it could even bear horses; but in winter, foot passengers durst venture only upon the skirts of it. It is evident from a number of concurring circumstances, that for many years it has been gradually increasing in height, though not spreading in breadth or length, so as to cover more ground. On Saturday, Nov. 16, about ten or eleven at night when all the neighboring rivers and brooks were prodigiously swelled by the great rains, a large body of the moss was forced, partly by the great fall of rain, and partly by some springs below it, into a small *beck* or *burn*,† which run within a few yards of its border, to the south-east. By the united pressure of the water behind it, and of this beck, which was then very high, it was carried down a narrow glen between two banks about thirty feet high, into that wide and spacious plain, opposite to Langtown; over part of which it immediately spread with great rapidity. The moss continued for some time to send off considerable quantities; which being borne along by the torrent on the back of the first great body, kept it for many hours in perpetual motion, and drove it still farther on.

The 17th of November presented a most melancholy prospect to the miserable inhabitants of that country. They beheld at least 400 acres of rich arable land covered with moss from three to twelve and fifteen feet deep. Many of them saw their houses, out of which they had narrowly escaped the preceding night, rendered inaccessible, or tumbled into ruins, and their corn, built up in stacks for their winter's provision, and the payment of their rents, floating on the surface of this new moss. Their loss, however, though great, is not so considerable as might have been feared: for some of them, by hazardous contrivances, got to their houses, and, through large holes made in the roof, conveyed their most valuable effects to the neighborhood. Only a few cattle, and a good deal of corn, and household furniture, but no lives, are lost. It is a singular instance of the mercy of Providence, that all the inhabitants escaped safely from this dreadful calamity, which, as it happened in the night time, might have buried them in mud.

When the waters subsided, the moss also ceased to flow; but two pretty considerable streams continued to run from the heart of it, and carried off some pieces of mossy matter to the place where it burst. There they joined the beck already mentioned; which, with this addition, resumed its former channel; and, with a little assistance from the people in the neighborhood, made its way to the Esk, through the midst of that great body of moss which obstructed its course. Thus, in a great measure drained, the new moss fell several feet, when the fair weather came in the end of November, and settled in a firmer and more solid body on the lands it had overrun. Then it was, that the poor tenants saved most of their effects.

It was, however, again swelled, and put in motion by the rains which fell some weeks after, and which caused a great additional quantity of the original moss to descend with violence, and force it forward in some places within a few yards of the Esk. Upon the return of the dry weather it has since greatly subsided, and is become so firm on the east side, that it will not probably move again; especially as the run of the beck, and the streams which fall into it after it comes into the plain, is towards the south-west. By this second eruption, it is computed that 300 acres more are destroyed, and the road from Dumfries to Carlisle by Langtown is rendered impassable. As a great number of small pieces are daily brought down by the streams which flow from the moss, it must still be advancing, though in a very slow and imperceptible manner; but such is the present state of a great part of it, that considerable quantities will yet be forced away by the first heavy rains, and may perhaps cover 20 acres more.

This, however, is not probable, as it is now got so near the Esk. As nearly as could be judged by the eye, and by the calculations made from the informations I received of the distances of the different places from one another, there cannot be less than 800 acres of rich arable ground overrun by this melancholy event, on which there were eleven different steads, containing twenty-seven families, and one hundred and ten inhabitants. Great part of the grounds belonging to seven or eight other places, is likewise destroyed; though fortunately the houses, being built on rising grounds, have escaped. Most of the land however may be recovered, by making proper drains in the summer season, and setting fire to the moss when it becomes dry. But though they were actually restored to their former flourishing condition, there is almost an absolute certainty, that they would be again partly overrun by the next winter's flood, unless some care is taken to drain the original moss also; which could easily be done, though not at a small expense. As it is in some places five, in others near thirty yards deep, it is submitted to the learned and ingenious, whether by burning the whole of it, it might not be made arable fruitful land, though the foundation be a mixture of gravel and soft spongy matter?"

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* Lake. † Small stream.

To prevent, or to lessen the damage that might be occasioned by any future flow, another gentleman proposes, either that its course should be diverted to the river Sark, on the west side of the moss, or that a clear passage should be made, in its present direction, to the river Esk; both of which he says are practicable; adding, that if some such method be not taken, much more good land will be covered by the flow.

By a list published of the farms covered by the moss, with the rent of each, the yearly rent of the whole is 246*l.* 16s. sterling, all belonging in property to the Rev. Mr. Graham of Netherby.

According to one account, the figure of the moss retains so much of a natural appearance, that a stranger is at a loss to conceive whence all this prodigious mass has come. But the people who lived near the mouth of the gap, tell, that they are sensible how much the moss has subsided, by objects on the west side of it, such as the planting at Graitney, which before were totally intercepted by the moss, being now obvious to their view. According to another account, the greatest part of the surface of the old moss is still whole; but the moss is now so much evacuated, that though formerly level, the middle of it is like a large glen between two hills.

The immediate cause of this eruption, is thought to have been the late heavy rains, especially the excessive fall on the day preceding the night in which it happened, which having overcharged the moss, and filled and distended the cavities within, and the inequalities upon the surface, the weight of so great a body of moss and water impending at the head of the gap, had there burst, and broke off, and forced its way down the gap. The remote cause of it is, however, thought to be so evident, from the situation of the moss, and of the adjacent lands on the east side of it, together with the former management of the persons who had cast their peats in the moss, that its not having broke out sooner is more to be wondered at, than its having broke out at last.

Extract from the Scots (Edinburgh) Magazine, for July 1771.

THE GREAT FLOOD OF 1771, IN VIRGINIA AND SOUTH CAROLINA.

"*Norfolk, Virginia, June* 6.

"Having the opportunity of Capt. Park calling here, and the inundation in James's River only talked of when the last ships left this, I thought it might be necessary to give you an exact account of it, especially as your friends above have not had an opportunity since. We are told, that the river began to rise the 25th ult. and rose three days, some part of the time at the rate of five feet in the hour, till it was about twenty feet higher than ever known before. All the tobacco at Westham, about 400 hogsheads, with the warehouses, are gone; and all in Shockoes was floating about, and a great part of it gone down the river. In short, it is said there are about 4000 hogsheads lost and destroyed. Considerable damage is also done at Warwick. In one store they saved the greatest part of the goods from the roof, by a vessel carried along side on purpose. From this circumstance you will be able to judge the height of it. I do not hear of any tobacco being lost at Rocky Ridge, but a fine crop of wheat is swept off Col. Byrd's low grounds and destroyed, and the ground covered entirely with a thick bank of sand. Every thing is carried off Elk Island but the negroes, and seventeen slaves are swept off from Mr. King's estate. All the houses of Tanau Island, with people, cattle, tobacco, &c. &c., on them, were seen passing by at Westham. Several ships were forced from their anchors, and drove ashore; but most of them were got off again. As it rained little or none proceding this flood about the falls, none suspected such a thing. It seems the rain fell chiefly among the mountains. We have no particular account from Rappahannock, but that the town of Falmouth has suffered greatly, as well by the tobacco as by quantities of dry goods."

"*London, July* 16.

"By the last letters from Virginia, we have a dreadful account of the overflowing of the Rappahannock River in that province, owing to the great and incessant rains which began on the 27th of May last, and continued without intermission till the 8th of June. The water poured down in such torrents from the mountains as to carry all before it, which caused the river to swell twenty-five feet higher than ever was known by the oldest man living: all the warehouses on both sides the Rappahannock were entirely full of water; and at the different warehouses in Yarmouth and Norfolk towns, in Virginia, upwards of 4000 hogsheads of tobacco were carried away by the rapidity of the stream, and entirely lost. The same letters add, that the number of inhabitants drowned in attempting to save their property from being carried away by the water is computed at 150."

"From Richmond we learn, that they have daily accounts of the devastations occasioned by the late floods. From the mountains to the falls, the low grounds have been swept of almost every thing valuable; and the soil is so much injured, that it is thought not to be of half its former value, and a great part is entirely ruined. One instance may suffice. A tract of land where the river forks, which before the fresh was judged to be richly worth £10,000 is not now rated at so many hundreds. Fourteen negroes belonging to that estate were drowned, and only one house left out of forty, which was sixty by forty feet. On Elk Island, between 6 and 700 head of cattle, hogs, horses, and sheep, have been lost; and near a hundred houses, besides, grain, tobacco, &c. At Farrar's Island, which the highest fresh never before affected, above eighty acres of fine land are rendered for ever incapable of cultivation, the soil being gone, and in its stead ten or twelve feet deep of sand, upon which, a layer of stones is as if paved. Many other islands have been torn to pieces, hills of sand thrown up, channels stopt, and their courses altered, and, in short, the face of nature changed. Old Joe, an honest and well-known negro fellow, at the falls of James's River, who is intimately acquainted with the remains of an Indian nation that has resided there for ages, says, that he was shown by their old men the marks of the greatest fresh handed down to them by tradition; and that, upon his carefully measuring, it wanted near fifteen feet of the late dreadful one. A ship at Warwick sounded from the beginning of the perceivable increase of the river, and found, that the fresh at its height was upwards of forty feet higher than the common tides. The lessened value of the lands, loss of stocks, houses, tobacco, wheat and corn in houses, with fencing, and the crops on the ground, baffle all description. Byrd's, Shocko, Richmond, Rocky Ridge, and Warwick, have suffered amazingly in the loss of merchandise, and tobacco, besides houses, &c. Between 5 and 6000 hogsheads of tobacco are gone from these places. The distresses of the people in Albemarle, and those parts of the country in the reach of the fresh, are not to be described; most of them being without bread to eat, or dwellings, and their stocks gone. Daily accounts are received of the loss of whole families, and houses come floating down with people on them, calling out for help, though none can be afforded. Upon the whole, it is believed that history scarce affords an instance of equal damage being done to any country, if the destruction of lands, lost of property, &c. be included."—*Virginia Gazette, June* 6.

"*Charlestown, South Carolina, June* 6.

"The uncommon quantity of rain that has fallen during the course of the last month, which is usually a dry one, has done incredible damage almost throughout the province, but more especially to the plantations upon the fresh water river swamps, where the freshes have risen from fifteen to more than thirty feet in twenty-four hours, totally destroyed the whole crops of a great number of industrious poor (as well as rich) inhabitants, drowned a great quantity of cattle and hogs, and put many people to the greatest difficulties imaginable to save their lives, upon the tops of their houses, trees, and little ridges of high land: in short, the accounts from all quarters are very melancholy. The first cutting of indico is entirely gone; hemp has suffered much; and more than a third of the crop of rice and corn is thought to be lost. The principal sufferers are on the Congaree, Santee, and Pedee, Wateree, and Savannah rivers. Many planters in Georgia are also likely to sustain great losses by the late wet weather. These accounts have occasioned the rise of the price of rice to £3 per hundred, and of corn to 20*s*. per bushel.

OPINIONS OF THE PRESBYTERIAN CHURCH OF VIRGINIA ON SLAVERY, AND THE NORTHERN EFFORTS FOR ITS ABOLITION.

To the Editor of the Farmers' Register.

Dear Sir—I send you an extract from the proceedings of the Synod of Virginia, respecting the fanaticism popularly known under the name of *abolition*. If you think it worthy of a place in your paper, please insert it and oblige your's, &c.

A member of the Synod of Virginia.

"One thing which presses with peculiar force on the Presbyterian Church in the south, is the spirit of abolition, as lately developed in some parts of our country. This spirit, we believe, is entirely contrary to the word of God. It is well known that the Apostles ministered and planted churches in countries in which slavery abounded, and that of a more aggravated form than ours; and yet masters and slaves were members of those churches, and equally under the acknowledged authority of the same spiritual teachers. In this way the inspired Apostles had the subject of slavery fully before them; and they gave directions without any appearance of reserve, for the mutual duties of the relation; leaving the whole subject of slavery to the benign and gradual operation of the gospel. These facts should convince us that the Apostolic directions in the New Testament ought to form the rules for the government of our conduct in this matter. If, after this, the master is criminal, it cannot be by sustaining the relation of master, according to the rules given by divine inspiration, but by the violation of those rules.

"There is, however, one passage of scripture which not only shows the criminality of abolition doctrines, but also so plainly and fully prescribes our duty in relation to them, that we think it proper to quote it at length. It is in first Timothy, vi: 1—5. 'Let as many servants as are under the yoke, count their own masters worthy of all honor, that the name of God and his doctrine be not blasphemed. And they that have believing masters, let them not despise them, because they are brethren; but rather do them service, because they are faithful and beloved partakers of the benefit. These things teach and exhort. *If any man teach otherwise*, and consent not to wholesome words, even the words of our Lord Jesus Christ, and to the doctrine which is according to godliness, he is proud, knowing nothing, but doting about questions and strifes of words, whereof cometh envy, strife, railings, evil surmisings, perverse disputings of men of corrupt minds, and destitute of the truth supposing that gain is godliness; *from such withdraw thyself*.'

"Here, we think, it is as plain as words can make any thing, that modern abolition principles and spirit constitute the case of those men who *teach otherwise* than the Apostle approves; and form the class from which he commanded Timothy to *withdraw himself*. The Apostle's teaching was that servants should count their own masters worthy of *all honor*, and do service to believing masters, because they *are faithful and beloved, parta-*

kers of the benefit. Certainly the modern abolitionist teaches otherwise than Paul taught; and if he cannot be convinced of his error, the only scriptural remedy is to withdraw from such.

"Another view of the case which we think important is this. When the General Assembly was formed, a large majority, if not all of the churches and presbyteries, out of which it was formed, were in slave-holding states. The attempt to make slave-holding a bar to communion, or to fair ministerial standing now, is changing the constitution of our church, and the original terms of communion. This we cannot permit. Therefore, the Synod solemnly affirm that the General Assembly of the Presbyterian Church have no right to declare that relation sinful, which Christ and the Apostles teach to be consistent with the most unquestionable piety—and that any act of the General Assembly, which would impeach the christian character of any man, because he is a slave-holder, would be a palpable violation of the just principles on which the union of our church was founded—as well a daring usurpation of authority never granted by the Lord Jesus. Lest the sentiments just expressed should be misunderstood, Synod would add that the likelihood of the necessity of any geographical division through the operation of this fanaticism, is not so great as it was some time ago. Yet, on this subject, be the danger small or great, a vigilance corresponding to the exigencies of the times is our manifest duty."

For the Farmers' Register.

COMPARATIVE VALUE OF APPLES, TO FEED STOCK, AND FOR SALE, AND THEIR PRODUCTS, CIDER AND BRANDY.

November 4, 1836.

During the two last summers and falls, my duties called me into the apple regions of the north. The following facts were obtained, in reference to the subject of apple cider and brandy.

1. Cider drinkers are peculiarly subject to rheumatism, to inflamed eyelids, to headache, bleeding at the nose, to sores and ulcers, difficult and tedious to cure, to affections of the stomach and bowels, and to premature trembling of the hand and head.

2. Cider drunkards are the most brutish and cruel of the unhappy tribe of inebriates.

3. An old orchard and a distillery, are almost invariably indices of widows, orphans, poverty and drunkenness.

4. There is a great loss of money in making either cider or brandy. Good eating apples are worth on an average 25 cents a bushel. Eight bushels of apples make a barrel of cider, and twelve barrels of cider make one barrel of brandy. Brandy at 50 cents per gallon would give about 15 cents per bushel for the apples. The loss is ten cents per bushel. This, on an orchard of one hundred trees, in ten years, would be over one thousand dollars! No allowance is made for capital and labor connected with distilling. Take these into consideration, and the loss is much greater.

5. It costs no more to raise good apples, suitable for market, than to raise apples only suitable for distilling. Very often apples are worth one dollar per bushel, and then the loss is immense, by turning them into brandy. I am told that in Mobile, apples sell now for ten dollars a barrel!

6. Engrafting and budding will change the character of an orchard, and more than compensate for the time and amount lost in producing the change, in ten years.

7. Apples make most excellent food for horses. Several physicians of extensive practice, in Connecticut and Massachusetts, feed their horses on apples and hay. I have never seen fatter horses—more sleek and spirited. The hair is much more lively, and requires less grooming than that of horses fed on grain. Mr. Norton of Farmington, Connecticut, has about the finest pair of horses I have seen. They are fed mainly on apples and hay. They travel very fast, and seem to have both wind and bottom. It is proper, however, to remark, that not as much grain is given to horses at the north, as is customary at the south. One thing is worth noticing—horses fed on apples, do not eat as much hay as when they are fed on grain. Very sour raw apples injure the teeth of horses; but when boiled, they do not. The rule of feeding is to commence with a small quantity and gradually increase to a bushel a day, for one horse.

8. Apples are most excellent food for beeves. The fattest beef I have seen, was made so on sweet apples.

9. Nothing will fatten mutton quicker than apples. It is necessary, or best, to cut up the apples when fed to sheep.

10. Hogs care nothing for corn if they can get apples: if sweet, the apples may be given without boiling: if sour, they must be boiled. Mixed with corn meal the flesh is firmer.

11. Apples increase the quantity and quality of milk. At first there was a prejudice against giving apples to milch cows; because it was thought they diminished or dried up the milk. It is true, that a *gorge* of apples, or any other green food, will cause a fever, and dry up the milk; but given in proper quantities, the effect is quite different.

12. Cattle and hogs are purchased and fattened on apples, and sold at a fine profit, when to fatten them on corn would ensure a loss.

13. Sweet apples and good eating apples are to be preferred as food for horses, sheep, and cows: also for hogs; though some recommend a mixture of sour and sweet for hogs.

If these remarks shall induce any one to test their correctness, by making a fair experiment, the object of my writing them will be fully answered.

THOMAS P. HUNT.

For the Farmer's Register.

THE MONEY MARKET.

The illustrious Paul, when persecuted by the Jews,, appealed unto Cæsar; and, I trust, the landed interest of the United States, headed by the "country gentlemen" of Virginia and Maryland, where, and where only, that invaluable class is to be found, will, at a period when "the bad combine," associate for the preservation of their rank, and the augmentation of their real consequence in the community—for the period has come, when "the bad having combined, the good should associate."

Little did I think, when I addressed you in May, under this head, that my prophecy would, at so early a period, have been fulfilled, and the wretched effects be so soon demonstrated, of loading the London market with so much paper, and for such a purpose, as that of administering to the avarice of the money jobbers and usurers of New York and Philadelphia. This, I regret to say it, was done by the Pennsylvania Bank of the United States; and its consequence has been the reduction of the price of all stocks and of their own from $125 in May, to $110 in November. How much better would it have been, if the capitalists of Philadelphia had done as have their brethren in Boston, and their fellow citizens in the south?

That institution committed a capital error in not suffering their charter to cease and determine, and then to claim one on a scale more correspondent to the extended wants and commerce of the country. But they forgot the difference of the two periods, 1815 and 1836; and, continuing in error, their proceeding with such a mass of paper to London, for the purpose of its being converted into specie, has not been less fatal to themselves than the country. The London papers tell us that interest in Great Britain has advanced, and foreign securities ceased to be in demand.

The bank should have recollected that commerce, like letters, is a republic, in which though all the members are co-equal in their claims, some of them are pre-eminent in their influence. Of this great republic, Great Britain is in the latter class, and on her mainly depends the welfare and prosperity of her sisters. Her system should be studied, and to those who wish so to do, I would recommend the attentive perusal of the parliamentary debates of 1825, on the one pound note act. Such a purusal led me to address you in May. But the habit of interference by government still seems to adhere to the prints of New York; for I perceive the Journal of Commerce still lauding the power of the state to control discounts, and deprecating the joint stock system in England because it does not do so. He is blind to the results of the chartered system in the one country and the other in England.* *In ten years* 61 *banks have been established and not one has failed.*

To read the censure of the Bank of England, is ludicrous, as if that body ever acted without the assent and approbation of the mercantile world, aided by all the light the governments of Britain and of all Europe could throw upon the subject. But the superficial are blind to facts, and the scheming reckless of consequences. However, the healthy state of the cotton market, the only article of remittance for European manufactures and bread stuffs, speaks volumes, and tells us that, if the bank prohibits stock jobbing, it protects commerce. However, the most interesting part of the subject is, what are the states now wanting money for, and how should the bank act? But this is discussed in my last paper, and the subject needs not to be renewed; and especially, as we shall so soon see what it is the government proposes to do; and which I freely confess, fills me with apprehension. C. L. C.

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* This sentence, evidently incomplete, stands thus in the manuscript.—Ed.

THE HARRIS SEEDLING.*

To the Editor of the Farmers' Register.

Frederickshall, Nov. 16, 1836.

In compliance with a request contained in the October No. of the Farmers' Register, I take pleasure in informing you, that I have growing in my garden, in the county of Louisa, a native grape vine, which was found in the woods upon my land, and transplanted. The grape is of the white kind, with a purple tinge when ripe, and larger than the common native grape. The clusters are unusually large, with a great number of branches. Mr. John Carter, near Richmond, has some growing from slips furnished by me, and expects to be able the next season to test their utility in the production of white wines. The flavor of the fruit, when ripe, is very delicious.

As I am no wine-grower myself, I should be pleased that any gentleman, who thinks proper, would propagate from the stock. If it be desired, I will forward some cuttings, this winter, to the care of Messrs. David Anderson, Jun. & Co., of Richmond, to be disposed of as may be directed in the December number of the Register.

FREDERICK HARRIS.

From the Zanesville, Ohio, Gazette.

MULBERRY AND SILK CULTURE. TWO CROPS OF COCOONS A YEAR.

Last spring I obtained an ounce and a half of the white mulberry seed, which I sowed on the 11th and 12th of April, on a bed 40 feet long, and 14 broad, in rows twelve inches apart, watering the bed twice or three times a week in dry weather, once a week with soap suds. A part of my seed, say one half came up the last of that month and the first of May, when the dry weather came on. The balance of my seed did not come up until after the long spell of rain about the first of June. By keeping the bed clean and occasionally stirring the ground between the rows, the plants grew rapidly, and those which came up before the drought, perhaps the number of three or four thousand, have attained to the average height of four feet and some to the height of four feet ten inches, but were I to sow again, I should occupy at least twice as much ground.

I also obtained of Mr. C. G. Wilson, ten trees of the Chinese mulberry of last year's growth, about a foot in height, which were brought from Boston, and did not arrive here until about the first of June at which time they were transplanted, but had no appearance of vegetating for about ten days, when the buds next the ground began to develope themselves, the top of the stock down to those buds dried up .By occasional watering in dry weather, and stirring the ground about the roots, those buds, together with several sprouts or suckers, which sprang up from the roots, some at the distance of two or three inches from the main stalk, grew rapidly and have attained to the average height of five feet ten inches. and one measuring six feet six inches, clothed with the most beautiful foliage I ever saw, of a deep green, and of a beautiful glossy silky appearance, some of the leaves measuring 14¼ inches in length and 10 in breadth. I intend, if I can preserve these ten trees entire the coming winter, to increase my number to one thousand from cuttings.

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* This name is affixed by the Editor. Mr. Harris will add to the service now rendered to the agricultural public, by furnishing, as he proposes, slips for distribution, through the channel he indicates. We warn those persons who may attempt to propagate these or other native grapes, that slips rarely succeed. When convenient, they should be made sure of living by being engrafted on rooted stocks of any other grape.—Ed.

I also obtained a few silkworm eggs last spring, which came out on the 12th and13th of May, and fed them on the native mulberry, as a school of experiment. They grew well and wound their cocoons in 35 days from the date of their hatching. The moth came out in a few days and laid their eggs, and as it has been shown that two crops in a year have been raised in theUnited States, and to use a trite adage, "what has been done, may be done again," in order to test the experiment satisfactorily, I allowed a second crop to hatch: they came out on 13th of July, and were fed from the limbs which I cut from my seedling trees, until the fourth age, and the balance of the season on the native mulberry. The worms grew as rapidly and appeared equally as healthy and vigorous as the former crop, and came to maturity five days sooner, and commenced spinning their cocoons in thirty days from the date of their hatching, and the cocoons were about the same weight.

The foregoing exposition will prove beyond the shadow of a doubt, the practicability of rearing two crops of worms in a season in our climate, and also the adaptation of our climate and soil to the successful culture of the mulberry, for in turning over the pages of horticulture, there is no where recorded, so luxuriant a growth as in the above instance.

A. P. WESTBROOK.

WILLIAM AND MARY COLLEGE.

In a journal devoted to such objects as this, and having especial regard to all the public improvements of Virginia, it will not be deemed outof place to mention the improvement of condition, and prospects of success and of increased public utility, of the venerable College of William and Mary. In a very recent official visit, we were gratified to find that the list of students had increased beyond our previous sanguine anticipations—the number in the scientific classes then amounting to 98, besides the pupils of the classical school. There is little doubt of the number being still increased so as considerably to exceed the greatest number of any previous year, even when William and Mary was almost the sole college of reputation in the south. To every true and devoted friend of this institution, and of lower Virginia, this state of things is subject of much gratification—and still more to those persons who know the causes of the former decline, which reached its lowest state of depression only three years ago, and know also the causes of the rapid and progressive resuscitation, and of the safe grounds which now exist for confidently counting on a continuance and increase of prosperity, The Visitors now neither fail in meeting, or in doing other duties. All the professorships are filled—and taken altogether, the men who fill them exhibit a mass of talent and fitness for their duties, and especially for educating *southern* gentlemen and statesmen, inferior to no other institution in the United States: and lastly, the present augmentation of the pupils, and consequent emolument to the professors, will insure the retaining of their talents for the College which has been the first to give them reputation and value. The loss of her best professors, from the insufficiency of their remuneration, was before a continually impending danger—for the greater the talent and reputation of any professor, the more likely he was to be tempted to leave the institution for a richer one. But now that fear is nearly removed—and it will be entirely so, if lower Virginia alone, will give its support to this institution rather than to others, and especially in preference to northern institutions.

Within the last three years, some important and much needed regulations have been enacted by the Board of Visitors, and which have already had most salutary effects, and have conduced, with other circumstances, to produce the present state of prosperity of the College. It is believed that a change equally beneficial has taken place in the execution of the statutes by the Faculty. The discipline is sufficiently strict, yet parental. In addition, the proper and necessary expenses of the statutes are at least as low, and it is believed lower, than any southern college of equal grade and reputation. Effectual measures are used to prevent the possibility of students incurring debts—the greatest danger to which they usually are exposed—and if their expenses in any other manner are excessive, it will be owing solely to the improper indulgence of their parents.

JOHN CARTER'S GRAPES AND WINE.

A grafted grape vine in the vineyard of Mr. John Carter, near Richmond, of only two years old, on a stock of 4 years (or 2 years when grafted on,) this season produced 40 lbs. of grapes. At the distance which it stands from the surrounding vines, 600 such might grow on the acre. The graft was from a seedling, of excellent quality for wine.

A quarter cask of Mr. Carter's wine from the Catawba Grape, at two years old, (which was two years before he thought it would be at perfection, or had designed to sell it,) was recently bought by a good judge of wine, at $3 the gallon. It is such (though of a different vintage) as was described in the first volume of this work. Mr. Carter thinks that 250 gallons of such wine may be safely counted on from the acre.

APPEAL TO ALL WHO HAVE BEEN, AND TO THOSE WHO OUGHT TO BE CONTRIBUTORS, TO THE PAGES OF THE FARMERS' REGISTER.

It may be as impolitic as it is unusual, for the editor of a journal to complain that the work is losing any portion of its value: but as we never have been much governed by usage, or by policy, we do not hesitate to state this charge—even though it has been made by none others, so far as we have yet been informed. *We* certainly have had no intimation that any of our readers and subscribers have become less pleased with the contents of the Farmers' Register—nor has it yet been indicated indirectly by any diminution of the subscription list—the surest test, it has been said, of the standing and favor of every periodical publication. But there has been a remarkable diminution of written communications within the last few months, to the great injury of the work as a vehicle of practical information and agricultural instruction, and to the imminent peril of its existence, should this state of things continue. It is true that we have presented to our readers many valuable extracts from new or standard agricultural works, probably but little known to the great mass of American farmers—and we have used every effort to keep supplied with whatever is new, and desirable to select from, in European journals, as well as those of our own country. But however valuable are such selections as a part of every number, they cannot compensate for the absence, or great scarcity, of original communications of practical and domestic matters.

It is now three years since we had similar cause to address our readers urgently on this subject—and the words then used, will in part, be quoted, as equally applicable now:

"This publication has been most favorably received by its patrons and by the public; and expressions of approbation and good will have been uttered far and near, among strangers as well as by friends, and in other states no less than Virginia. Numerous testimonials of the high and general estimation of the Farmers' Register have been received from our correspondents, besides those which have been published when connected with other matter—and in the latter case, such expressions as were merely complimentary have often been moderated, or altogether omitted in the publication. Our subscription list has already extended beyond our expectations, and continues to increase; and the undertaking has not only been secured from pecuniary loss, but promises an amount of profit which at first was not anticipated.

"But with all the high degree of gratification which we have derived from this reception, we are not so deluded as to attribute it to editorial talents, nor so inflated as to be blind to the danger which still threatens to destroy the value, and even the existence of the Farmers' Register. We are certainly not disposed to depreciate its worth in the public estimation. On the contrary, we believe that if it was to end at this time, great and permanent benefits, produced through its agency, would remain for the improvement of agriculture. But these important services have been principally performed by our correspondents, and to them we yield the honor due. The light and instruction thus furnished by a few, establishes fully what we have before said might be done by the united efforts of all, or even of the greater part of our readers. But except from a few, in comparison to the very many well qualified to afford valuable instruction, no such assistance has been offered, and we fear is not intended to be furnished. Nothing but that assistance is wanting to make the Farmers' Register every thing that the kindest and most sanguine of its friends may have anticipated: but without it, we do not hesitate to say (however opposed the admission may be to the maxims of our new trade,) that its usefulness will soon diminish, and its existence perhaps will not last much longer. Neither complimentary expressions, nor subscribers, nor their money, will make an agricultural journal of much value, even if conducted by editorial talents very far surpassing our limited stock. But all that we ask, or wish, to insure the highest degree of success and usefulness for our work, will be that each reader, who is competent, will add something for the information of others, and in some degree act as others have done, and follow, as well as applaud, their good examples."

We earnestly hope that this appeal will not be made in vain—and *more especially* in regard to the hundreds of intelligent cultivators of the soil who have given to the Farmers' Register the aid of their subscription, and pecuniary support, but who have never contributed in the slightest degree to fill its pages, and in that manner to make any return to others for furnishing the great amount of valuable information received through this channel. Let but a proper sense of what they owe in this respect to others visit with proper force those who have been thus delinquent, and there would be no longer ground for such complaints, nor danger of the loss of interest or value in this work. There seems at this time to be some general and wide spread cause for this torpor of American agriculturists. The evidences are not exhibited only in the pages of the Farmers' Register—but in those of every other of the agricultural journals of the United States. Was the deficiency of original matter in this publication alone, or even in but half of all such cotemporary works, it would be easy to fill well our monthly numbers by selections from the others, that were more successful. But no such facilities are offered. The best pieces, (suitable to Virginia and the south,) selected from all the agricultural periodicals in the United States, do not suffice for this end. Is it that the energy and zeal of the agricultural class—every thing that ought to be devoted to the improvemnnt of agriculture—is swallowed up, or smothered, by schemes of western emigration, of speculations in Texas lands or gold mines —or by president-making, or office-seeking?

Unless others (and *many* others) will lend their aid, the editor of an agricultural journal, even with far greater abilities than ours', can do but little. We have always, and most readily, admitted, that the main value of the Farmers' Register was furnished by the communications of its correspondents. *Our* services and merit have consisted merely in drawing forth these contributions to agricultural knowledge and improvement: and if the inducements inviting such contributions are now insufficient, we would gladly make them stronger, in any proper mode that may be suggested.

There is one means for collecting information, and enlisting contributions, that we have always desired to avail of, but as yet in vain, except to a very limited extent, and in desultory, hurried, and chance directed efforts. This is by the making of agricultural tours, and surveys, and reports of particular farms, or farming districts. We have in vain attempted to engage, by the offer of pecuniary compensation, the aid of abilities suited to this object: and the continual confinement heretofore required by the mechanical labors of publication, has prevented the editor from giving, with any system or regularity, part of his time to such ends. But arrangements will be attempted to permit some release from this confinement, for a week or more in each month—and so much time, it is hoped, may soon be given to the search for agricultural information, in various parts of Virginia. Still this object will be but very imperfectly reached, until the service can be made continuous—either by engaging the aid of an efficient coadjutor for that special purpose, or otherwise of one in the mechanical branch of the business of publication.

ERRATA.

In the communication on *Hessian Fly*, No. 6, p. 342, col. 1, line 7, the following words in *italic* were omitted in the manuscript, and should be supplied. "In one of these years, it happened, that my crops, thus treated, suffered as much, perhaps more, *from the fly*," &c.

In communication on *Mud Walls*, No. 7, p. 428, col. 1, line 15 from bottom, for "*adage*," read "*old age*."

Though we acknowledge and correct errors with the utmost readiness, we must be permitted to say that such as affect the sense, rarely, if ever, occur, except from omissions, or illegible writing, in the manuscripts furnished by most of our correspondents. If care was generally taken to write legibly for publication, the editor would be saved much labor, and some responsibility, and correspondents would seldom if ever have cause to complain of their words being misprinted or omitted. But we do not mean to complain of the *form* of what is so much valued in *any* form. We are content to undergo any labor of decyphering, rather than to lose any of our correspondents' highly valued communications.

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TO CORRESPONDENTS AND READERS.

The following articles were received too late for this No. and will appear in the next. *Proceedings of the Fredericksburg Agricultural Society—Address to the Rockbridge Agricultural Society—Remarks on the Express Mail.—The Commercial Report also came after the last sheet was printed.*

MINERALOGY.

THE school of Analytical Chemistry, Mineralogy, end Geology of the Mineralogical Society of Virginia, will go into operation on the 3d of December next, in the Philosophical Rooms of Hampden Sidney College. The meetings will be held every Saturday, at ten o'clock in the morning, during the four following months.—Fee $20.

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WM. DRAPER, M. D. Chemist to the Society,
2t Professor of Chemistry and Nat. Philosophy, Hampden Sidney College.

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A MONTHLY PUBLICATION,

Devoted to the improvement of the Practice,

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

VOL. IV. JANUARY 1, 1837. No. 9.

And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." *Swift.*

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TO CORRESPONDENTS AND READERS.

The following communications were received too late for insertion in this No. and will appear in the next: "*Observations on Close Rooms*"—"*On keeping farm accounts*"—"*Rail Roads—Interests of Norfolk in those to the West*"—"*Plaster of Paris on marled land*"—Also, "*Account of the diking and draining of low-grounds,*" which waits for an engraving—and "*Rail Road from Norfolk to Charleston,*" which waits to be decyphered at a time of more leisure.

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Dec. 28—3t

THE FARMERS' REGISTER.

VOL. IV. JANUARY 1, 1837. No. 9.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

For the Farmers' Register.

OBSERVATIONS MADE DURING AN EXCURSION TO THE DISMAL SWAMP.

By the Editor.

Whoever has heard any description, however slight and imperfect, of the great morass known by the name of the Dismal Swamp, must have been interested and impressed by the peculiar features and remarkable circumstances mentioned. Yet few persons have made any personal observation of, or paid much attention to these things, except those whose near residence, and early and long continued business and habits of life, have made them so familiar with the swamp, that they have lost, or perhaps never enjoyed, the freshness of feeling which novelty would have excited. Persons thus long acquainted with the ground, do not seem to think its circumstances very remarkable, and therefore do not offer their information to strangers. On the other hand, strangers, who at least might learn the facts thus acquired by residents, do not even direct inquiries so as to draw them forth, because totally ignorant of their interest, and even existence. Few strangers would ever have been induced by curiosity to attempt the great labors necessary for even a slight examination; nor would any have probably seen more than some points on the outer margin, but for the great highways now opened through the swamp—the great canal, the road on its bank, from Norfolk to North Carolina, and the railway which dips into the northern extremity of the swamp. These passages have given to thousands a rapid passing glance at certain portions of the scenery: but in every other respect, these numerous passengers have added nothing to the scant information previously possessed by the public. No visiter has made the investigation of the peculiarities of this unknown land a main object—and still less has any person paid attention to the geological and agricultural aspects in which this region well deserves consideration. I am but little qualified, either by scientific acquirements, or by opportunity for personal investigation, to supply these deficiencies. Still, in the absence of better digested and more accurate information, I will now offer such facts as were learned or observed, during a recent hurried visit to the Dismal Swamp, together with the speculations that these facts and observations suggested to my mind. Under circumstances so unfavorable for careful or full investigation, it is not probable that mistakes can be avoided. But I am willing to hazard being found in error, in the hope that the needed corrections may be furnished, and more full as well as correct information be given, by others better acquainted with the localities.

The part of the Dismal Swamp lying in Virginia, is about 25 miles from east to west, and about 20 from north to south—that is from near Suffolk to the Carolina line. The swamp stretches perhaps 20 miles more southward within North Carolina, but with much contracted width, and limits not well defined on maps, or by report. With such minor variations as will be mentioned hereafter, the whole of this extensive region is one great morass, or quagmire, except for the partial firmness caused by its cover of vegetables, and their matted roots. It would be naturally supposed that the swamp was much lower than all the surrounding lands, and the general receptacle of the numerous streams flowing from them. But, on the contrary, the swamp is higher than nearly all the firm and dry lands that encompass it, and the interior of the swamp is generally higher than the outer parts. The only exception to both these statements is found on the western side, where for some distance, say 12 or 15 miles, the streams flow from higher land into the swamp, and supply all its abundant and overflowing water. But towards the north, east, and south, the waters flow from the swamp to different rivers, and give abundant evidence, by their courses and their rate of descent, of the swamp being higher than the surrounding drier and firm ground. I do not mean that, at the junction of the two, the swampy ground is highest. On the contrary, it is generally bordered by a flat ridge of land perceptibly, though very little higher: but this ridge slopes downward on all sides except the west, and soon descends to a level greatly below the general surface of the swamp. The accurately levelled profile of the railway from Portsmouth to Suffolk, and of the Dismal Swamp Canal, and the Land Company's Canal, all furnish still stronger and more accurate evidences of the general fact stated. The railway passes through about 4 miles of the northern extremity of the swamp—and is there higher than when on the firm land some miles away on either side; and is 6 to 7 feet higher than on firm and dry ground near to Suffolk and to Portsmouth. The central part of the swamp is 5 or 6 feet above the middle section of the Dismal Swamp Canal, which section is some 13 feet above the rivers into which it empties at both ends—and these rivers are not more than 5 or 6 feet below much of the dry but low-lying land of this generally flat country. If it could be supposed that the streams, which flow into the western part of the present swamp, had for ages been bringing, not water, but mire almost as fluid as water, the spreading of that mire over the basin of firm subsoil, which now underlies the swamp, would have caused nearly such slopes, and form of the surface, as now exist—descending from the issuing streams on the west to the centre of the area, and thence descending towards every other part of the circumference. The surrounding slightly elevated rim, and various small and narrow ridges of poor and firm land, which rise like low islands in various places above the surface of the swamp, and the gradually descending slopes from such summits under the adjacent swamp soil, all give countenance to the supposition that the swamp is a compensatively recent formation or deposite on the lower foundation.

But whence came this enormous deposite of 25 miles in width, and in many parts 10 to 15 feet in thickness? The flood of liquid mire, which was supposed above for the purpose of illustration, of course was impossible. Neither could the deposite have been made by the alluvium of the streams—because they bring down very little, and because the soil of the swamp is not such as would be formed by such a cause. It is not principally *earthy*—as are all alluvial deposites, of every grade of fertility and consistence—but *vegetable*—and this peculiar and regular constitution may point out the origin, and explain the growth, of this vast body of high morass.

Before seeing the Dismal Swamp, and making some examination of its different soils, I had always considered that no true peat soil existed in Virginia—and that it could not form, nor remain long, if already formed, owing to the warmth and length of our summers, and the consequent ease with which vegetable matters runs into fermentation and putrefaction. I have several times incidentally expressed this opinion in different publications, and the last time, but a few days before visiting this region. (Far. Reg. p. 504 vol. IV.) I still hold this opinion, as to all common lands and localities, and in circumstances similar to those in which most peat mosses exist in Europe. But the Dismal Swamp is certainly a peat soil, or soil formed almost exclusively of vegetable matter, though the kinds of plants, and the manner of the formation, may differ much from European peats. In Scotland, the climate is so damp, and the summers are so short and cool, that in many situations, the natural vegetation of one year, if left undisturbed, will not rot during the next; and it remains, either wholly or principally, adding to the height of the surface soil, without giving it any increase of fertility. If water flows into such land, it is absorbed by the vegetable matter, and acts to give greater vigor to growing mosses, and other aquatic plants, and still more to retard their putrefaction when dead. Thus, in the situations most favorable to the formation, that is the coldest and most moist, (without being overflowed by water,) the peat grows to many feet in depth—and even on pasture lands, or arable left untilled, the surface becomes peaty or moory, having an excess of vegetable matter, but in that undecomposed state which makes a soil less, instead of more productive under tillage. Hence, the peats of Britain, whether of 6 inches or 6 yards deep, are barren, or at least tending to make a soil unproductive: and when brought under tillage, besides drainage, these soils require operations to decompose their excess of vegetable matter, to fit them for producing grain crops. For this purpose, the dry and shallow peats are pared and burnt—and the deep peats are limed, dug up and stirred, and even manured with dung, to quicken fermentation. Now no such formation of soil can take place in such a climate as ours, because the summer's heat and continuance are more than sufficient, under ordinary circumstances, to ferment all the vegetable matter that the preceding year had produced. Paring and burning the soil, which is a common and excellent part of preparatory tillage in England, on any common highland soils that have been left in pasture, could not be effected in Virginia—and if it could, would be injurious, by destroying the vegetable matter, which, if not burnt, would be decomposed soon enough.

It is true that we have soils as entirely of vegetable formation as many of the peats of Britain. Such are all the fresh water tide marshes, parts of many swamps, and the whole of the great Dismal Swamp. But the difference I take to be this. The vegetable soils, being kept constantly either covered by, or saturated with water, are kept from entirely rotting, and are increased in thickness by annual accessions of vegetables. But though not enough rotted to lose much of the bulk, they are enough so to form manure: and these lands need only perfect draining to be at once highly fertile. Then indeed the soil begins to rot too rapidly; and if kept dry, will continue to rot as long as a great excess of vegetable matter remains. Hence the opinion which I have long maintained by reasoning, and to my very great loss have seen proved in practice, that our fresh water tide marshes, if diked and drained, will rot away, as deep as they are made dry enough for tillage.

The soils of the Dismal Swamp are much nearer to the peat of Europe than any other that I have observed: indeed the upper layers of the juniper lands, to the depth of some inches, may be formed of the same mosses. But below the living roots, though still it is all of vegetable formation, the plants are so rotted they are simply a soft black mud. The general cover of all this kind of ground, under the shelter of the large trees, shrubs, or reeds, is a thick carpet of tender mossy plants, which rise to 4 or 5 inches high, and which are taken up by the hand so easily, that they seem to have scarcely any hold of the ground. Where these grow, the surface is as wet as water can make it, if not covered an inch or two. This, the least solid of the whole, is the soil most favorable to the juniper trees—which stand, barely supported by the long tap root, in these quaking bogs of of "surf" or "sponge," as this earth is called by the laborers.

The peat of Europe, or at least certain qualities of it, is good fuel: and I have but lately learned from a very intelligent gentleman who resided in Boston during the late war with England, that the peat of Massachusetts was then used for fuel, in consequence of the scarcity and high price of coal. In an article in a New England paper which has since reached me, I see the use of the same fuel recommended at this time. The vegetable soil of the Dismal Swamp, (like that of our tide marshes,) when dry, is highly combustible—and being principally of vegetable origin, would leave but little ashes, or earthy residue. But on account of being so well rotted, it would probably make but poor fuel.

The immense and continually growing fields of peat, which are spread over the earth in cold countries, are probably the materials for future beds of coal, after being buried deep in the earth by some of the convulsions of Nature which have so often changed the face of the globe. When compressed by the weight of mountains to the density of stone, the peat of the most open texture, or the most rotted and worthless, may become a coal valuable for fuel. I do not believe that geologists admit this theory of the formation of coal: but it seems to me a more plausible origin than from other than peaty matter.

It is not difficult to conceive how the soil of the Dismal Swamp should have been growing in thickness, and spreading over more extent ot surface; and that it shall continue to do both, if the existing causes are suffered to operate. The streams which flow from the western highland are sucked up by the earth, which from the nature of its composition, absorbs and holds water like a sponge: and it is thus filled or very slightly overflowed by water, and yet no part covered deeply, because the superfluous water finds or forms channels to escape into rivers, which head at various adjacent and much lower points. This continual wetness, and the extreme richness of the soil, combine to produce a prodigious growth of aquatic plants, of various kinds, and of all sizes, from the diminutive moss to the gigantic cypress. The wet soil causes more evaporation than would take place from water alone--and evaporation causes cold—and the heat of the sun is in great measure excluded by the thick cover of trees. Hence, a coldness of the earth suitable to a far more northern climate is produced, and maintained. The leaves and moss, and other vegetable matters that fall, are but partially decomposed, and thus add annually to the thickness of the soil.

As might be inferred from the operation of the causes named, but little of the surface of the swamp is many inches either above or below the water, though the level of the swamp is in some places five feet lower than in others, and perhaps much more. Standing, but shallow water tends to raise the earth to its surface: and if, by drainage, drought, or any other circumstance, a part of the land should be so much higher than the water as to become quite dry, the first accidental fire would reduce it to a lower level.

It may well be supposed, from the foregoing general description, that the swamp furnishes very difficult ground to travel upon. But I had no adequate conception of the magnitude of the difficulties before personally making the trial. In addition to the general wetness of the earth—the most dry being a mire, from sinking in which the traveller is guarded only by the mat of living roots—the undergrowth of evergreen shrubs, and vines or reeds, cause still greater impediments to his progress.

It is difficult to imagine a sufficient motive to have induced any man to penetrate a mile into the swamp, before paths were cut and made solid enough, for the purpose of getting the timber. And these obstacles long prevented any person from going far from the borders. It was as late as some twenty years before the revolutionary war, that the lake, which is the most beautiful and magnificent feature of the region, was first discovered by a hunter, named Drummond, who had lost his way, and therefore wandered miles through this "Slough of Despond." He could not have reached the lake in the shortest line from the main land in less than three miles—and probably it was many more. What must have been the sensations of a man, so lost in such a gloomy labyrinth, when he came suddenly upon the border of this splendid sheet of wide water! Lake Drummond is nearly oval—seven miles long, and more than five wide. It has no beach, the thick and tall forest being at and in its margin. The water is generally even with, and often gently overflowing its banks—and the banks (if such they may be called) sink perpendicularly, so that whether the waters of the lake are higher or lower than is usual, it makes no difference in the breadth of the water, and but little difference in the general appearance of the shores. There may be a difference between the highest and lowest water, from the opposite effects of the wettest and dryest seasons, of three or four feet—and there would not be as much, perhaps, but for the artificial reducing of the water, in the dryest seasons, to supply the great canal for the purposes of navigation.

This beautiful lake—and which no doubt seems the more beautiful on account of the gloomy scenery passed to reach its borders—is so much like belonging to fairy land, that it is not strange that it should have been connected with sundry popular delusions. Some persons at first had affirmed, and others believed, that the lake had no bottom—or that it communicated with the neighboring ocean by a subterraneous passage. There was but slender ground for this delusion, as the lake is quite shallow, and the level of the bottom very regular. Mr. Mills Riddick sen. of Suffolk, told me that he assisted Commodore Barron in sounding across the lake. The depth about the middle, where greatest, was 15 feet. The bottom is of mud like the swamp, but sometimes a pure white sand covers the mud a foot, or perhaps more, in depth.

About the time that the lake was discovered, another event took place which produced ultimately the present proprietary state, and peculiar business and management of the swamp. This was the "taking up" by Gen. Washington, and a few other gentlemen acting upon his suggestion, of all the then unappropriated lands of the Dismal Swamp in Virginia. Before that time no persons had taken possession (by course of law,) of any lands, but those at and near the margin of the high land, because the interior lands were not deemed worth paying the lowest taxes on. Gen. Washington whose business as a land surveyor gave him many opportunities of acquiring possession of valuable public lands, and who obtained much of his wealth in that manner—saw a rich farm on the border, which had been rendered productive by being drained. Thinking that the whole swamp was equally available for cultivation, he formed the association above named, bought the farm in question, and took up all the remaining state lands, estimated then at 40,000 acres, but which are now supposed to be much more. They excluded the lake from their patent, though it was completely surrounded by their land, considering it not worth paying a tax for. By this ill judged economy the company has since suffered. When the Dismal Swamp Canal Company was afterwards chartered, they were granted by the commonwealth the exclusive use of the water of Lake Drummond to feed their canal—and this grant serves to shackle the efforts of the Land Company, (since also incorporated,) and would prevent the adoption of any general plan for draining. As is usually the case wtih corporations that come in contact, they seem more fond of squabbling with and opposing each other, than of uniting in any general procedure for the good of both.

The only objects of the Land Company at first were agricultural—and they commenced, and for years carried on tillage on their farm, and drainage to extend it. For the latter purpose, they dug a canal of some miles in length from the high land to the lake, which is still large enough for the passage of boats. This is now known as the "Washington Ditch". But whether their plans were judicious, or had the defects inherent in such joint stock companies, their labor and capital yielded little profit. The war soon followed, and before its end half their slaves went off to the enemy, as was generally the case in places so near their encampments. After peace was made, the work still went on badly, until the Company undertook the getting of juniper shingles. This business, which was not at first counted on, has since become their sole pursuit, and immensely profitable, and must continue profitable until the timber is mostly consumed, which indeed is rapidly approaching completion. The shares into which the stock was originally divided, have increased in price from $3000 each to more than $15,000; and the dividends made are large even for the highest price. But unlike most other stocks, this is diminishing in real value, with every year's waste of timber—and unless the land itself is made of value by drainage, the stock of this rich company will, at some future time, lose its market value, as rapidly, and to many owners as unexpectedly, as it was formerly acquired.

What I have stated of the Land Company, was learned from gentlemen who have been long and well acquainted with the general affairs of the company: but as their knowledge was not official, and rested on memory, facts may have been incorrectly stated as to dates, amounts, or other minor circumstances.

It had long been my intention to visit these scenes—but it was only very lately that a first and hasty visit was made, which has enabled me to judge of and to describe them, so far as will here appear.

On Nov. 17th. I reached Suffolk by way of the railway, from Portsmouth, which passes through a few miles of the swamp at its northern extremity, and thus permitted a first slight glance. It seems unfortunate that the first approach to the swamp, of almost every person hereafter, will be on the rapidly moving railway train. The savage gloom of the face of nature is altogether unsuited to the highly artificial facilities by means of which the traveller is flying past—and the discordance serves to lessen the high gratification which either the conveyance or the scene alone would cause, when new to the observer.

It was too late on that day to commence a voyage to the lake—nor could it be made on the next: for though every thing else necessary had been carefully provided, there were no good boatmen out of the swamp—and without those accustomed to the peculiar mode of navigating the canal, there was no getting on. The leisure afforded by these disappointments permitted me to visit some of the most interesting lands in the neighborhood—and to see some improvements on swamp lands, to which my remarks will now be confined. Having mounted on horseback, we returned, by a different route, to the swamp where it is crossed by the railway. This great public improvement had effected much of the first and heaviest labor necessary for draining the adjacent swamp lands, and had clearly indicated the proper mode to pursue—and the proprietor on one side, Mr. David Jordan, was making proper use of the opportunities thus offered. The swamp land here is 6 to 7 feet higher than the part of Suffolk which the railway passes over; and the ditches dug on each side, to drain and to raise the track of the road, furnish deep and wide discharging outlets, to receive the waters from all smaller ones draining from the swamp. This land had been filled or covered with water before the railway was begun: the ditches dug by Mr. Jordon, at right angles to the road, and emptying as above stated, have laid the land dry, and kept the water as much below the surface as the depth of his ditches, which is from 2 to 2½ feet. Still this is not enough for so spongy a soil, which will draw much moisture upward, and from considerable depths. I advised giving 10 or 12 inches more of depth to the smaller ditches, and still more to the large rail road ditch, which can be easily done. The water comes from the general overflowing or saturation of the swamp, and therefore a good large ditch ought to surround the whole piece designed to be reclaimed.

This tract of land was bought by Mr. Jordan and Mr. Benton, after the railway was made, at $7.50 the acre. Immediately adjoining, and also on the road, another body of land of 2000 acres had been bought before the road was commenced, for only $900—a most striking evidence of value thus increased. All the wood is now made marketable, and is cut to a great profit, and sent by the train to Portsmouth. It is cut (by the job) into 4 feet lengths, at 50 cents the cord—carted and corded along side the road for 25 cents more—(and this expense might be lessened one-half, by making branch wooden railways—) and the wood is sold at $1.25 in that situation, and now commands $4 if delivered in Porsmouth. As but little superintendence is required, the profit from an acre must be very considerable.

The swamp soil next the railway was from 1½ to 2 feet thick, resting on a good dark colored clay. The soil did not appear to vary materially in texture, as seen in the new ditches several hundred yards towards the interior. It is of the more firm and earthy kind, known as "gum swamp," but which seems to be composed in great measure of vegetable matter. It appears precisely like the soil of the gum and ash tide swamps on James River. Farther from the rail road, the ditch reached land which formerly had been burnt over, so as to destroy its trees, and it was now covered by the closest possible growth of reeds, among which were scattered many young pines. The soil did not seem to change, otherwise than by becoming deeper. The subsoil here is a stiff yellowish clay.

Early on the morning of Nov. 19, our party assembled at the northern end of the Land Company's Canal, about a mile from Suffolk. To this point all their shingles are brought by boats—and passed over to the tide creek close by, and which is about 20 feet lower in level, where they are received by vessels which carry them to the northern cities. Our party was mostly composed of gentlemen of Suffolk, who most kindly aided all my views and wishes. The boat was flat bottomed, long and spacious, belonging the Land Company, and designed solely for conveying passengers in trips to the lake, for pleasure or business. It was well suited for the purpose, and was well manned and provided for this occasion. The mode of propelling the boat is the same as is always used for the shingle boats. A strong pole is fastened across the square head, and another in like manner at the stern, at right angles to the boat, the other ends extending across the tow-path on the margin of the canal. By these poles the men push the boat along in a rapid walk, and at the same time lean on them so as very much to lighten their labor. Four experienced hands accompanied our boat, who relieved each other from time to time. It seemed strange to me that horse power had not been substituted for that of man for this business; for though it would be costly to provide enough solid earth to make a tow-path for horses, when once done, one horse would pull as many boats as perhaps 15 or 20 men could shove.

This canal was dug 12 feet wide, 4 feet deep, and is 10 miles in length, and very nearly straight. Its water is almost a level—a gentle current flowing from the middle part towards each end. The firm land soon was passed through—(in which the banks are from 1 to 2, and for a short space 3 to 4 feet high—) and we then entered the swamp. The tow-path still continued to be a firm but low bank for a short space more—and then for the remaining 7 or 8 miles was scarcely above the surface of the adjoining swamp, and merely afforded better footing by being trodden, and thereby consolidated, and by the poles and other wood placed along where water covered the ground, for the boatsmen's steps. The earth thrown out in digging the canal must have made on each side a wide and high bank. But so little elevation now remains, that it furnishes alone sufficient proof of the correctness of my previous opinion, that such land, if kept dry, will rot away, leaving nothing but the very small portion of earthy matter in the soil. A permanent horse tow-path could therefore only be made by earth boated from the firm land, or by wood. Wooden roads for mules are made throughout the swamp, to convey the shingles to the borders of the canal, or lake—and these roads are so rough, and bad, that it seems as if as much power must be lost on them, as by using hand labor to propel the loaded boats. Some of these roads are 5 or 6 miles in length—and their united length must be very great. They are constructed as follows. Double lines of poles are laid in the direction of the road, about the distance apart of the cart wheels. Across these are laid split pieces, merely long enough for a single track of a cart, of 4 to 6 inches in diameter, and as angular and irregular as may be supposed, from mauling. These lie close to each other across the sleepers, and present a very rough and unstable surface for the wheels, and still worse for the feet of the mules. Still, I was told that on such roads, a mule will draw as heavy a load as an ordinary roads, on land. If so, it would seem that they would draw ten times as much on smooth longitudinal tracks, or such wooden rail, or tram-roads, as are described in Vol. I. of the Farmers' Register.

The escape of the water in numerous places over the margin of the canal, served to explain how there could be a regular current always setting towards the *closed* end of a level canal.

We soon reached juniper trees, (or white cedars) and the softest swamp soil, in which situation only these trees grow. I had never before seen a juniper—and should not now have distinguished them from the red or true cedars, but for their situation, greater height, and the beautiful straightness of their long naked trunks. The length of the branches, and the spreading and bulk of the whole top, bear but small proportion to the diameter and length of the trunks of the juniper. The trees are beautiful, and especially when they stand thick, forming a high roof of their evergreen tops, supported by numerous columns formed by their long and straight stems. They are not often large, or are too valuable as timber to be permitted to reach much size. Most of our whole course was through the "burnt woods," a large track of which nearly all the growing trees had been formerly killed and consumed by great fires in former times.

Though the form of the juniper is well adapted to stand on its soft and yielding foundation of mire, still when large it is easily overthrown by winds—and perhaps as many such were lying beneath the surface of the peat, as were standing erect. When thrown down, they are soon covered by water, and keeping wet, they never rot, except the sap wood, which is less than an inch thick. Much of the timber now got, is from trees long covered a foot or two deep under the surface soil, and which are found by the workmen by sounding, and then dug to and sawn off into shingle cuts, though half covered by water. Some of the great fires, in certain places, have brought to view and into use, more good timber than they injured, by burning the soil down to where numerous trees had lain perhaps for a century concealed, and their existence unsuspected. By the way—in digging down into the swamp, charcoal, the plain evidence of the former fires, and of the height at which the surface had then stood, is often found at several feet below the present surface—thus giving practical proof of the growth of the soil in thickness by the operation of the natural causes before reasoned from. But I get on slowly upon the canal.

The canal, when perfectly straight for a long course, with the trees on each side almost joining their branches across, presents a beautiful vista and perspective view—and with our singular boat and its equipage would have furnished a fine subject for a painter. Still more striking were the same scenes when we returned at night, with the bright light of our fire partially displacing the general darkness. The landscape painter would find many new subjects in this region, where every thing is strange and new—and so might the student of botany and other branches of natural history. A writer like Irving might here find enough interesting matter for description and narrative, to fill a volume. The land and the water—the vegetables and the wild animals—the inhabitants in their habits and occupations—are all as different from the surrounding country, as if the traveller had suddenly passed into a far remote region.

I landed several times in the course of the day, at places of different appearance and growth, and of different levels, and walked far enough to see the smamp in all its various conditions. The parts most easy to walk through (and these are scarcely passable) are where the original gigantic forest growth has not been destroyed or hurt by fire, or where the reeds, forming a thick growth, have all died, and thus permit one, with some effort, to break his way through such a brittle though close barricade. The getting of timber being confined to the juniper trees, and these being of comparatively small size, the original grandeur of the forest is but little impaired by the labors of man. The cypress is here the king of the forest—and this, with the gums, and all other trees except juniper, are left untouched. The cypress grows on the same kind of land with the black gum—which, as before stated, is much firmer than the juniper lands. The farmers here, who have given any consideration to the subject, suppose that though the juniper land, if drained, would sink and soon fail, that the gum and cypress lands would be permanent. No doubt they would be *more* durable—but the vegetable matter that will *burn*, will also *rot*, if placed in circumstances favorable to fermentation: and soon or late, all the *excess* of vegetable matter in the soil, not combined with and fixed by the earths, and especially by calcareous earth, must rot away, and disappear.

We passed through sundry such changes of land, and of its vegetable cover, as have been described—but still a general uniformity of appearance prevailed, owing to the deep gloom and miry surface of the surrounding swamp, the sluggish and dark water of the canal, and its scarcely varying course. The only sign of life was seen at intervals in a "camp" of a pair of shingle-getters. Their houses, or shanties, are barely wide enough for five or six men to lie in, closely packed side by side—their heads to the back wall, and their feet stretched to the open front, close by a fire kept up through the night. The roof is sloping, to shed the rain, and where highest, not above four feet from the floor. Of the shavings made in smoothing the shingles, the thinnest make a bed for the laborers, and the balance form the only dry and solid foundation for their house, and their homestead, or working yard. Yet they live plentifully, and are pleased with their employment—and the main objection to it with their masters, (they being generally slaves,) and the community, is that the laborers have too much leisure time, and of course spend it improperly. Their heavy labors for the week are generally finished in five, and often in four days—and then the remainder of the week is spent out of the swamp, and given to idleness, and by many to drunkenness. All the work is done by tasks: and the employers have nothing to do except to pay for the labor executed. About 500 men are thus employed in the whole swamp, by the Land Company, and by numerous individual land owners. With all their exposure, the laborers are remarkably healthy, and almost entirely free from the autumnal fevers that so severely scourge all the surrounding country. It is said that no case has yet occurred of a shingle-getter dying of disease in the swamp—nor did my informants know that any one had been so sick as to require to be brought out. A young white woman lately died, whose father and his family have lived ten years in the swamp—but she had just returned from a visit of some length to the open country outside. It is well known that the borders of extensive peats in Britain are healthy, and in that respect are very different from the marshes of the same regions.

At length we came to another straight canal, (the old "Washington Ditch,") by entering which a slight deviation was made from our previous straight course. This turn obstructs the view, and thereby adds to the pleasure of the surprise that immediately follows. But a few yards more are traversed, when the boat passes, almost without warning of a change, from its narrow and shaded channel upon the wide-spread surface of the lake. The boatmen, having exchanged their poles for oars, rowed nearly two miles toward the centre of the lake. It is encompassed to its margin every where by a thick growth of tall trees, in which the cypresses, by their greater height and singularly formed summits, show most conspicuously. The general level horizon presented to the eye by the surrounding forest, is made lower and irregular in two large places on opposite sides of the lake, plainly indicating the wide and desolating passage of the last great fire, which left nothing alive in its track, nor any thing standing, except some of the largest trunks of trees, many of which still remain, though naked and scathed by fire to their summits. But so rapid is the growth on this swamp, that the burnt land is generally and closely covered by a young forest of considerable height, and among which are junipers of twelve inches through, which are already used for shingle timber.

It was a bright and clear day, and not a breath of wind was felt before emerging from the canal. But though there imperceptible, there was enough wind to ruffle the surface of the lake. The observer would at first suppose that the lake was in a great measure secured from the effect of wind, by its inland situation, and its close surrounding forest barrier. But high as is this barrier, it is low in comparison to the elevation of high lands in general—and the low level of all the adjacent country, and the vicinity of the Atlantic, permit to the winds such a sweep, that Lake Drummond is remarkably subject to their effects; and the violence of storms, is here about as commonly exhibited as on the sea.

The water, though clear and transparent, is so deeply colored by the extract of vegetable matter, as to seem black when seen in the lake and canals. When taken up in a glass, it is found that this deepness of color is delusive—and that it is about the color of pale rum or wine. It is every where through the swamp the same in quality, though not always as deeply tinged. It is, by some, considered medicinal, and is preferred for drinking by all the laborers and others most accustomed to its peculiar, and at first, disagreeable flavor, to any other water whatever. Some twenty-five years ago, invalids, and especially those suffering under pulmonary affections, were in the habit of visiting the swamp in the summer, to drink the swamp water for improvement of health; and they often remained for weeks together at a tavern on the Dismal Swamp Canal, beyond the opposite side of the lake.

The water in the lake, is now about 18 inches below the usual level, and of course we found the swamp so much the drier, and more accessible, near the borders of the lake. But notwithstanding this cause for the unusual dryness of the surface and notwithstanding also, the thick carpet of recently fallen leaves and other vegetable matter on the surface, sustaining the footsteps, I was continually reminded, by the yielding of the miry earth below, of the unsoundness of the support. Through the greater part of the year, the basin of the lake is full to the brim, and overflowing at many places into the surrounding swamp. The water in the Land Company's canal through which we passed, however, was then kept at its ordinary height, by means of a wooden stop-gate placed across the mouth of the canal.

The fish of the lake are of species similar to those of the ponds and fresh water streams of the neighboring country—but of some, the sizes are much greater. The gar is sometimes seen above five feet long. Some kinds of the fish are highly valued, and dining on them is not the least enjoyment of the pleasure parties that often make excursions in summer to the lake.

Reeds, at remote intervals, bear seeds which have a considerable resemblance to wheat, and which will make tolerably good bread. These seeds are so seldom borne and are usually so few, that most persons do not know of their existence. Whenever a reed brings seed, it dies the same autumn. A few years ago was a general and great "reed mast," as a full bearing of seed is here called—and all the reeds consequently died at once. The present growth is in many places as thick and as beautiful as ever—varying however in height in different places, as if of different years' sowing, from 18 feet to 9 or less. But it seems as if nature demands a change of crops in this as in many other cases. I infer this from walking into large pieces of ground covered by a former growth of reeds, of which all had died in the last great mast season, and not a single living reed had followed, or was seen on such places. It is a vulgar error that the reeds bring seed once only in seven years. There are few more beautiful single plants than a reed of large size—and their general appearance is as pleasing when in smaller size they stand so thick as to form an almost impenetrable undergrowth.

It is known to most persons that bears still inhabit the Dismal Swamp, though long ago driven from every other part of lower and middle Virginia. But probably most have thought, as I did before this visit, that they were so rarely met with, that the killing of a single one would be a matter for great exultation, and cause of some notoriety to the huntsman who was so lucky. But I now learned that they were so numerous, that there were but few men who resided near the margin of the swamp who had not killed one or more. A young gentleman of our party, had shot several dozens of these beasts. He told me that the largest weighed, after being skinned and gutted, more than 500 pounds. They do not usually weigh half as much. It is difficult to raise many cattle or hogs on the adjacent farms, though the swamp furnishes such abundant food for both, owing to the slaughter committed on them by the bears. A bear will with ease kill a full grown cow, and has strength to drag away the carcass to a suitable hiding place. No dogs will hunt these animals to much purpose, and therefore it is not often attempted. The most numerous pack will seldom even bring them to bay, and will never attempt to seize on them. The bears are traced and found by the hunters, by listening for the noise of their nightly depredations in corn fields, or among live stock, or when breaking the limbs of the trees they climb in search of acorns or gum berries: or they are baited and killed by traps, or heavily loaded set muskets, the latter being a common and successful mode of destroying them. I heard related by the gentlemen of our party, and by the boatmen, sundry accounts of such adventures—and enough could easily be had to fill a second volume of Davy Crockett. Indeed, the story of one remarkable adventure which has been bestowed in print on Crockett, I believe, or if not, on some other western bear hunter, I found had been pilfered from the honors of an old borderer of the Dismal Swamp: for whether the story be true or false, (and it is fully believed here,) it had been told by the hero of it for forty years before his death.

Some more formal testimony of the great number of bears in the swamp was presented at the recent meeting of the Land Company, in a written proposal submitted to them by an individual for getting up their oak timber. This paper stated as a reason for their taking such measures, that the oaks were suffering, and many dying, under the effects of the depredations of the bears. This statement which would otherwise have been to me impossible to conceive a meaning for, was explained by the account received of the habits of these animals. Heavy and apparently clumsy as they are, they are expert climbers, and in that manner seek the gum berries and acorns, which, in their season, form a favorite part of their food. To reach the acorns on the extremities, they draw to them and break off the limbs, even when of large size—and into these broken places worms of a particular kind enter, or eggs are laid, as in the case of the pine bug, and in time the trees are killed by their borings.

A still more ferocious animal found here is the larger of two species of what are called *wild cats*. This name is certainly misapplied—but my acquaintance with this branch of natural history is not sufficient to enable me to fix the kind of either animal, from the descriptions given. The larger is brown, with a short tail, and is about as large as a middle sized or rather stout dog. The smaller kind is mole-colored, and has a long tail. Pole cats are also sometimes found in the borders of the swamp.

The most singular recent fact with respect to beasts of prey, is the appearance here of a solitary wolf a few years ago. As no wolf has been heard of east of the mountains for many years, the kind of this destructive animal was not suspected until long after he had been committing his ravages on the sheep about Suffolk—and more than a year passed before he was at last killed. His howling had often been heard by the inhabitants of that town, so near did he forage—but as his shelter in the swamp was perfectly secure from intrusion, and he moved out only by night, and as no dog would pursue him, it seemed long impossible to destroy him. He at last, like many warlike or predatory heroes, from Sampson down to Macheath, fell a prey to female attractions. Tired of celibacy, he was seeking a mate though of a different race—a bitch at a farm house: and her other suitors made so great an outcry over the foreign intruder, that his presence was discovered, and he was shot.

Upon inquiring for some one who had witnessed and was able to describe the great fire of 1806, the boatmen referred me to old Toby Fisher, who was then, as he still is, and has continued to be, a shingle-getter in the swamp. Accordingly, we visited Toby's camp—and his account was readily obtained. The first indication of the extent of the fire was the uncommon prevalence of smoke, and its long continued increase. But a shift of wind would remove it from the neighborhood of the laborers, and for as much as a week together they were free from it. At last, the fire approached so near that the falling of the great trees was heard in rapid and continued succession, like the reports of guns heard at a distance—and when still nearer, bears and other "varmunts" were seen fleeing from destruction, and some times singed and lamed from having been forced through the fire. At last the laborers nearest the approaching flames were driven in, and in such alarm, that all hastily embarked on the lake, and left the swamp. From 30,000 to 50,000 shingles, ready for market, which were the wroperty of a single individual (the father of one of our party,) had been previously thrown into the old canal—but without obtaining much of the expected effect in saving them from the flames. The upper layers, above the water, having taken fire and been consumed, and their weight removed, the next layer would rise to the same height—and though wet, were soon dried enough, by so powerful a heat, to take fire also. Thus the shingles, which had been completely submerged, continued to rise and to burn, until but a small part was left. The fire continued about a month, and passed over the greatest part of the swamp. From other authority, I learned that the soil was in many of the dryest places burnt down as deep as two feet, producing such effects as have been already mentioned.

To such a fire, in former times, acting on a still dryer state of the swamp, it seems probable that the lake owes its existence, by the soil being burnt so low as to allow water to be retained, and of depth too great for plants to grow therein, which otherwise would have recommenced a growth of peat, and by it ultimately have filled again the void. That this vast basin was thus hollowed out by fire seems to be proved by stumps at the bottom being found charred on their surface—by the perpendicularity of the banks—and the operation is rendered probable, strange and great as the effect may be, by the reasonableness of its taking place, when the supposed existing circumstances are considered. I do not suppose that the basin was burnt to its present depth—and merely because it is not likely that the earth could have been dry to the depth of fifteen feet, or even of half that depth. But if burnt to three feet only, and then filled with water, the continued growth in thickness of the margin of the swamp generally, in the course of ages would raise the surface to fifteen feet above the present bottom of the lake.

But if the swamp soil is growing in thickness, and (as I suppose) the lake in depth, it is also believed, and with much appearance of truth, that the lake is likewise continually growing in superficial extent. That this is taking place along a large part of its margin, is evident to present observers, and still more to those who remember the state of things many years ago, and have witnessed the gradual encroachments of the water. Some however doubt whether other parts of the shore may not be growing, by filling up. I do not see why the water may not be spreading on all sides. The violence of the waves, in high winds, must undermine and wash away the banks—and of the earth thus removed, the lightest parts are dashed over upon the swamp, where they dry and rot, or otherwise add to the depth of the soil—and the more earthy and heavy, serve to raise the bottom of the lake, and the more so where nearest to the banks—and in this manner to cause the regular deepening towards the centre that is found to exist. Until the parts thus filled up shall rise near enough to the surface to support plants, and thus gradually grow to be high peat again, the lake must be widening on every side to which the waves are driven by violent winds.

The following results, showing the proportions of vegetable matter contained, were obtained by subjecting to trial different soils of the Dismal Swamp. The method used was to measure the bulk of each specimen, by pressing it moderately and equally into a measuring glass, marked at equal portions of an ounce of water each. The measured portions of earth were then separately exposed, in an iron vessel, to a strong heat, for one or two hours, until each seemed as much reduced by combustion as could be by such means. Coally matter still remained with all the ashes, showing that the burning was not completely finished. All these soils have been before described, either particularly, or generally. The amounts lost may be supposed to show the comparative proportions contained of vegetable matter.

1. Of the soil of the reed covered swamp land (Mr. Daniel Jordan's) described page 517, taken about 1½ or 2 feet from the surface, 3 parts (oz. measures,) lost in bulk, by burning, 2¼ parts, or 75 per cent.

2. Of the gum swamp soil, also Mr. Jordan's, described page 517, taken from 1 to 2 feet below the surface, (but quite free from any mixture of the clay subsoil—) 3 parts lost, by exposure to heat equal to any used, only half a part—or 16 per cent. This became black by burning, but could not be made to take fire, as the other specimens did. So small a loss was unlooked for.

3. Of the gum and cypress swamp soil near the north-western side of the lake. This was presumed to be some of the highest and firmest land, as it had been ditched and cultivated by old Draper in turnips, the best of which were as large as musket bullets, and had leaves 6 inches long. The specimen was free from unrotted vegetable matter. Five parts lost by burning 4½ parts, or 90 per cent.

4. Of juniper soil, taken from 6 to 10 inches below the surface, and below all living roots or unrotted vegetable matter. The specimen was a black slimy mud, which gave no indication to the eye of having an excessive proportion of vegetable matter. Eight parts (half a pint) of the soil after burning, left one third of a part—showing the vegetable matter destroyed by fire to be 96 per cent. This specimen and the next, only, burnt with flame for a short time.

5. Soil of gum and cypress, under its original growth—about 200 yards from the north-western side of the lake. The specimen taken from six to ten inches below the surface, and free from living roots, or unrotted vegetable matter. Eight parts (half a pint) was reduced by burning to one third of a part, or lost about 96 per cent. This specimen was burnt at a different time, and with more powerful heat than the others.

Before closing these remarks, some speculations will be submitted as to the feasibility and policy of draining this immense body of swamp, supposing it permitted by the laws, and not opposed by any existing rights or interests.

In comparison with the magnitude of the object, it would seem to be both a cheap and certain operation to drain this whole body of land. All the water, except the rain that falls directly on its surface, it may be supposed flows from the streams coming in within the extent of some 10 or 15 miles of margin, from the highland on the western side. If a canal was dug through the western side of the swamp, its northern end emptying into the Shingle Yard Creek near Suffolk, and the southern end emptying into the head of Perquimans River, which rises in the swamp and flows southward into Albemarle Sound, this canal would divert from the swamp all the waters which now run in and continually flood it, and the level of the water would be sunk just as deep as the bottom of the canal might be made. Lake Drummond would be deprived of its supplying source, and would become dry, except the deepest central part. Nearly the same extent of land might be drained, and the same objects effected, by deepening the Land Company's canal, and giving it a northern outlet to tide water, and by opening another cut from the Perquimans into the lake, and both parts so deep as to lower the water 7 or 8 feet. Either of these modes however would destroy the navigation of the Dismal Swamp Canal, for which such a vast amount has been spent. But probably the water might be enough reduced to lay the land dry, without hurting the navigation, or materially diminishing the present extent of the surface of the lake. If lowering the water of the lake 5 feet only, would make the land dry enough, that reduction of level need not deprive the great canal of any of its present supply of water, because its feeder from the lake now has 5 feet of descent, and of course might be as much deepened at the highest end. But if the middle section of the canal, between its highest locks, could be deepened so much as to dispense with those locks, every difficulty would be removed, and the navigation would be greatly improved and facilitated in future use, and the general drainage be made far more perfect.

But there is a prior question of some importance. If a general plan of drainage is ever so cheap in execution, and certain in immediate results, would it be advantageous to so change the state of the swamp? The policy is at least doubtful, though the balance of advantages seem to be in favor of the drainage. An immense body of most fertile land would be brought into cultivation: but it would rapidly rot away, and while rotting, would probably be as unhealthy, as it now is remarkable for healthiness.

But every thing on the subject of draining large swamps, held by many different proprietors, in Virginia, is mere matter for theoretical reasoning and of useless speculation. Nothing can be done in practice, no matter how great the promised advantages, or the existing evils. The laws, indirectly, yet completely, forbid the making of any such improvements on a large scale: and still greater obstacles are presented in this case, where, in addition to the existence of separate rights of hundreds of individual proprietors, there would be the chartered and landed rights, and conflicting claims, of two great joint stock companies. Under these various circumstances, it may be safely predicted that the possible good or ill effects of a general plan of draining the Dismal Swamp will never be practically known—at least, not during the continuance of the present legal policy of Virginia.

PROPOSAL TO DRAIN THE DISMAL SWAMP.

By William Byrd of Westover.

Written more than a hundred years ago.

[It was after the preceding article on the Dismal Swamp had been written, and was partly in type, that we received and for the first time saw the manuscript from which the following article is printed, and also the full and minute journal of Col. Byrd, of the survey of the line between Virginia and North Carolina, which he superintended as one of the Commissioners of the Colony of Virginia. For the use of this antique paper, we are indebted to the owner, George E. Harrison Esq. of Brandon, and also for the original journal of his distinguished ancestor. This proposal, was founded on the information obtained by the survey, and recorded more fully in the journal—and upon these grounds and suggestions it is probable that the present Land Company was formed at a subsequent period, and in which Col. Byrd, or his son, was a partner, and his shares are still held by some of his descendants.

The journal (written in 1728) is interesting not only for its antiquity, but for the early views, and then supposed facts, which it presents. In our next No. will probably be inserted the portion of the journal embracing the passage, probably the earliest made by man, of the Dismal Swamp

The account of Col. Byrd given here, and in his journal, is erroneous as to several particulars which rested then merely on report, and therefore could not be more correctly known by him. For example, as to the supposed pestilential effects of the air—the total absence of animals—and as to the general width of the swamp, which he greatly underrated. It will be also observed, both from this piece and still more from his journal, that there was then no suspicion of the existence of the lake; and yet according to the maps of highest authority, its southern margin is within less than a mile of the state line, which was so long in being traced and marked by the surveying party which Col. Byrd in part directed and superintended.

The manuscript, in our charge, is the original, in the hand writing of the author—and though time-worn, and requiring much care to handle without injury, is perfectly legible. It is here copied literally.—Ed. Far. Reg.]

A Description of the Dismal.

The Dismal is a very large swamp or bogg, extending from north to south near 30 miles in length, and in breadth, from east to west, at a medium about ten miles. It lyes partly in Virginia, and partly in North Carolina. No less than 5 navigable rivers, besides creeks, rise out of it, whereof 2 run into Virginia, viz. the South Branch of Elizabeth, and the South Branch of Nansimond Rivers—and 3 into North Carolina, namely, North River, North-west River, and Perquimonds. All these hide their heads, properly speaking, in the Dismal, there being no signs of them above ground. For this reason there must be plentifull subterranean stores of water to feed so many rivers, or else the soil is so replete with this element, draind from the higher land that surrounds it, that it can abundantly afford these supplys. This is most probable—because the ground of this swamp is a meer quagmire, trembleing under the feet of those that walk upon it, and every impression is instantly filld with water. We coud run a long stick up to the head without resistance—and wherever a fire was made, so soon as the crust of leaves and trash burnt through, the coals sunk down into a hole, and were extinguisht. The skirts of the Dismal towards the east were overgrown with reeds ten or 12 feet high, interlaced every where with strong bamboe-bryers, in which the men's feet were perpetually intangled. Among these, grows here and there a cypress, or a white cedar, which last is commonly mistaken for the juniper. Towards the south end of it, is a very large tract of reeds, without any trees at all growing amongst them, which being constantly green, and waving in the wind, is called the *Green Sea.* In many parts, especially on the borders, grows an evergreen shrub very plentifully, that gos by the name of a gall-bush. It bears a berry which dyes a black colour, like the gall of an oak, from whence it borrows its name. Near the middle of the Dismal the trees grow much thicker—the cypresses as well as the cedars. These being always green, and loaded with very large tops, are much exposed to the winds, and easily blown down in this boggy place where the soil is soft, and consequently affords but slender hold for the roots, that shoot into it. By these the passage is in most places interrupted, they lying piled in heaps, and horsing on one another: nor is this all, for the snags left upon them point every way, and require the utmost caution to clamber over them. 'Tis remarquable that, towards the heart of this horrible desart, no beast or bird approaches, nor so much as an insect or a reptile. This must happen, not so much from the moisture of the soil, as from the everlasting shade occationd by the thick shrubbs and bushes, so that the friendly beams of the sun can never penetrate them to warm the earth. Nor indeed do any birds care to fly over it, any more than they are said to do over the lake Avernus, for fear of the noisome exhalations that rise from this vast body of dirt and nastiness. These noxious vapours infect the air round about, giving agues and other distempers to the neighbouring inhabitants. On the western border of the Dismal, is a pine swamp above a mile in breadth, great part of which is coverd with water knee-deep; however, the bottom is firm, and though the pines growing upon it are very tall, yet are they not easily blown down by the wind. So that the people waded through this part of it, without any other hindrance but what the depth of water gave them. With all these disadvantages the Dismal is in many places pleasant to the eye, though disagreeable to the other sences, because of the perpetual verdure, which makes every season look like the spring, and every month like May. This dreadfull swamp was ever judgd impassable, 'til the line divideing Virginia from North Carolina was caryd through it in the year 1728, by the order of his late majesty. Nor would it have been practicable then, but by the benefit of an exceeding dry season, as well as by the invincible vigour and industry of those that undertook it. Some of the neighbours have lost themselves here for some days, but never had either the courage or curiosity to advance very far. Nor can the difficultys of passing this inhospitable place be better conceivd, than by the long time that was spent in doing it, even by men who were not altogether without apprehentions of being starved—they being no less than ten whole days in pushing on the line 15 miles, tho' they proceeded with all possible diligence and resolution, and besides, had no disaster to retard them.

Advantages of Draining the Dismal.

The foregoing being a true and faithful account of the present condition of the Dismal, if any way coud be found to drain it, the benefits both to his majesty and these colonys, would be very considerable.

1. First, that vast extent of bogg, which is now of no value to the crown, nor ever can be, in the condition it lyes at present, will come in time to pay the same quit-rent that other lands pay in this colony, and employ a great number of people.

2. By draining the Dismal, it will make all the adjacent country much more wholesome, and, consequently, preserve the lives of many of the king's subjects; this will happen by correcting and purifying the air, which is now infected by the malignant vapours rising continually from that large tract of mire and filthiness.

3. After the Dismal comes to be drained, it will be the fittest soil in the world for producing of hemp: the propagating of which, is with so much reason desired and encouraged in his majesty's plantations. Besides, the hemp made in this place will have the advantage of being nearer to navigation than it can commonly be in this colony.

4. As the Dismal must be draind by the help of canals, to be cut from the northern to the southern rivers, there will be a safe and easy communication, by water, betwixt Virginia and North Carolina, to the manifest advantage of both. Virginia will have the benefit of being the port and public mart, to which the inhabitants of North Carolina must bring their commoditys; and these, again, will have the convenience of shipping the effects of their industry, and receiving their returns from Great Britain, in good ships—there being no inlets into the hither part of that province, but what are dangerous even to the small vessels that can enter them.

Conditions of Draining the Dismal.

The Dismal then being so utterly useless to the crown, and such a nusance to the neighbouring country, and the advantages of draining it being so many, there remains no difficulty but to find out a method of doing it without leading his majesty into an expence, or laying a burthen on the people; and I humbly conceive that neither of these objections can be raised against the following scheme.

It is therefore proposed that his majesty be graciously pleasd to grant the Dismal, and all the land not yet taken up, lying within half a mile of any part of it, to the petitioners hereafter named; and the better to encourage them to undergo the heavy charge of draining it, 'tis farther proposed, that the said petitioners may have such grant, free from rights, and be also exempt from paying any quit-rent, for the space of 50 years, except one pound of hemp yearly, on St. George's day.

It is also proposed, that all the persons employed in draining tho said Dismal shall be excused from paying any levys for the space of ten years after the date of the said grant.

Nor can it fairly be objected, that such exemption from rights and quit-rents will be any loss to the crown, because nobody will ever take up any land in the Dismal, but with intent to drain it—and the expence of that will be too great to undertake it without this encouragement at least. Wherefore, since the king can get nothing for it as it now is, it woud be more to his majesty's interest to grant it on the prospect of a future advantage, than to let it lye wast, and continue a nusance to perpetuity. Nor woud the country be a looser by indulging the undertakers of this great work with a freedom from levys, because of the advantages that woud happen to it from their industry—and because most of the hands employed therein, will be imported on purpose to carry on this laudable design, and consequently woud never pay any levys without it.

And to remove all suspicion of fraud, it is likewise proposed that a condition be inserted in the royal grant, that in case the petitioners shall not drain the said Dismal in the space of ten years, they shall then be obliged to pay all arrears of quit-rent from the date of the said grant, together with the full value of the rights which ought otherwise to have been payed down in the beginning, proportionably to the quantity of land so granted. The petitioners humbly relying on his majesty's goodness, to indulge them a longer time in case unforeseen difficulty shoud require it.*

Proposals for Draining the Dismal.

If this great undertakeing be managed prudently, it may be completed in the forementioned time of ten years, for the summ of four thousand pound sterling, and perhaps for a great deal less.

It is therefore proposed, that this summ be divided into 20 shares, and they to be subscribd by as few persons as possible. That the Earl of Orkney, Sir Charles Wager, Sir Jacob Acworth, and Col. Bladen be invited to encourage this subscription, being well wishers to these colonys, as well as to the propagateing of hemp in his majesty's plantations, and the rather because their credit may be necessary in obtaining the royal grant. So soon as such grant shall be obtaind, the first step ought to be to procure a man that perfectly understands draining of land, at a moderate salary, and while that is transacting in England, the whole tract should be exactly surveyd here, and the levil of it tryd. After that, a proper piece of land shoud be chosen on the skirts of the Dismal, whereon to make the first settlement. Sufficient land may be found out there that may be laid dry by a trench only, and with that improvement done, produce hemp and rice, as well as Indian corn.

The next advance must be to build convenient houses to receive the people necessary to be employd in the beginning, and to provide the proper tools, bedding, cloaths, and provisions for them. When these are all ready, let 10 seasoned negros be purchased, of both sexes, that their breed may supply the loss. Let these be employd in clearing and in trenching the ground, in makeing of corn and other requisite improvements.

In the mean time, a moderate stock of cattle should be provided, which will winter on the edges of the Dismal with very little dry feeding.

It may be proper to teach two or more of your negro men to saw, make shingles, burn tar, draw clap-boards, and set up tight casks, that so all the timber cut down to clear the ground, may be turnd to the best advantage. And the mony to be raisd from all these improvements will help to defray the expences of the first settlement, and in some measure enable the work to carry on itself; that so the mony remaining in bank may be reservd for the purchase of negros, as fast as room can be made for them, and your work shall need a greater number of hands to carry it on with vigour.

When you have thus got a firm footing, a near computation may be made what increase of strength will be wanting the second year—remembering to purchase no more negros than you have made provision for, and there is no doubt in the world, but by the time the whole mony is expended, the Dismal will be made as good land as as any in the country, with at least 300 negros working upon it, and stockt with an incredible number of cattle. From all which we may safely conclude, that each share will then be worth more than ten times the value of the original subscription, besides the unspeakable benefit it will prove to the publick.

An Estimate of the First Expence.

To the building a quarter, barn, and house for an overseer,	£ 60 00 0
To the purchase of 10 seasond negros, half men, half women,	300 00 0
To cloaths, bedding, tools, and provisions for the first year,	40 00 0
To 20 cows and calves, 9 steers, one bull, and a horse,	50 00 0
To the wages of an overseer, and his provisions,	25 00 0
To accidents and charges unforeseen,	25 00 0
To soliciting the grant in England,	50 00 0
To surveying the Dismal, and the expence of the patent here,	50 00 0
	£600 00 0
To 20 negros the 2d year,	400 00 0
To 25 negros the 3d year,	500 00 0
To 25 negros the 4th year,	500 00 0
To 25 negros the 5th year,	500 00 0
To 25 negros the 6th year,	500 00 0
To 25 negros the 7th year,	500 00 0
To 25 negros the 8th year,	500 00 0
	£4000 00 0

The foregoing account shows only how many negros may be purchased for £4000, being the summ subscribed, to be employd in the Dismal; but besides that mony, there is no question but the profits ariseing from the labour of the negros on the land, which will every year be laid dry, will be very considerable—insomuch that it will not only defray all incident charges, but also purchase many more people to finish this great work. And for those which happen to dye, 'tis probable that their place will be fully supplyd by their children, if care be taken to buy as many women as men. And because it will be some years before such children grow up to a stature fit to work, it will be prudent to lay out part of the mony in boys and girls, which will not only season better than men and women, but will be very soon fit for labour, and supply the mortality that must happen among so great a number. Besides the advantages of propagation, there is another benefit in provideing wives for the men: it will keep them at home, and prevent their rambling abroad anights, from which arise many great inconveniences. By this practice they learn to be dishonest, take cold, and lose their rest, whereby they are less fit to do their work the following day. Besides, when they have wives in other familys, they are frequently poisoned by the jealousy of their rivals, who think they have a much better right to the affections of their fellow servants, than any stranger. By this many lose their lives.

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* This paragraph, in the manuscript, is marked across, by a single stroke of the pen.—Ed.

[COPY OF PETITION ANNEXED.]

To the King's most Excellent Majesty,

The petition of

Humbly sheweth:

That whereas there is a large bogg, situated partly in Virginia, and partly in North Carolina, which lyes wast by reason of the mire and water with which it is covered, and corrupts the air of all the neighbouring country by the noxious vapours that perpetually ascend from it, to the great annoyance of your majesty's subjects: and whereas, many considerable advantages woud arise, both to your majesty and those colonys, from the effectual draining of it, which cannot be performed without a very great labor and expence—

Your petitioners therefore humbly pray, that your majesty will be graciously pleasd to grant to your petitioners the said bogg, and all the land not yet taken up, lying within half a mile of any part of it: and the better to enable them to support the heavy charge of draining it, your petitioners further pray, that your majesty will please to grant them the said bogg, free from rights, and also exempt them from paying any quit-rent for the space of 50 years, except one pound of hemp to be paid yearly.

And your petitioners shall ever pray, &c.

For the Farmers' Register.

HASTY OBSERVATIONS ON THE AGRICULTURE OF THE COUNTY OF NANSEMOND.

By the Editor.

The county of Nansemond, exclusive of the considerable portion embraced in the Dismal Swamp, and other smaller swamps and tide-marshes, is generally of sandy, and naturally poor soil, moderately high and undulating on and very near Nansemond River and the tributary streams, and very level in the larger remaining part of the county. The smaller portion of river lands, and the larger body of the back lands, or "piney woods," as called in distinction from the river lands, are very different in several important respects, besides that of the nature of the soil.

From the very short and limited opportunity which I had for making observations on the agriculture of Nansemond, it seemed, with a few exceptions of spirited and profitable improvements, to be in a very low state: lower indeed, considering the great natural resources for making profitable improvements of the soil, and products from its cultivation, than any other part of Virginia, that I have yet seen. It is reported, however, that there is a still more rude and degraded state of agriculture, a still greater neglect of the advantages offered by the soil and its locality, in the adjacent counties of Norfolk and Princess Anne: as if the more that nature offers to man of her bounties, the less he is disposed to avail of their benefits, or indeed of any portion of them in a proper and profitable manner. It is indeed passing strange—and not sufficiently explained by all the reasons stated, that the country immediately surrounding the oldest, and long the most important commercial town in Virginia—having every advantage of markets—with much productive soil, and the most abundant resources for enriching the balance—with waters offering nearly as rich products as the lands—and in addition, with the long continued, and long to be continued annual expenditure of vast sums from the national treasury on the great public works in this region—that notwithstanding all these and other advantages, that this oldest settled and longest cultivated part of Virginia, and of the United States, should be now the least removed from the wild state of nature, that the inhabitants generally seem to be losing, rather than gaining, in the general progress of improvement, knowledge, and refinement. If, in addition, the mania for emigration to the west should rage hereabout as it is doing in the middle region of Virginia, the time may come when the howling of wolves will be heard from the suburbs of Norfolk.

The most general rotation of crops in Nansemond, (if any deserve the name of rotation,) is 1st, Indian corn, 2nd, grazing—and so on, as long as the land will bring a crop that will pay half the cost of tillage. A still more scourging course is not unfrequent, which is corn every year, as long as the land can bear it, or until the more extended clearings of the cultivator permit him to adopt the improvement of the two-shift rotation above described, and to let his fields have "rest" every other year, under the close grazing of such natural herbage as may attempt to grow. Upon the naturally high fertile shelly lands on Nansemond River, almost continual tillage under corn, as a matter of choice, for many years together, and with little or no manure, was the general practice: and such was the astonishing durability of the lands, that to the last they gave pretty good crops, and exhibited evidences of great power of resuscitation in the soil, if allowed any chance by proper resting, or putrescent manure. On the poor back lands, where under corn every year, field peas are also raised in every intermediate row. Of these but part are gathered for seed, sale, or home consumption, and the hogs are turned in to eat the balance, as soon as the corn is fit to be gathered. This mixture of the pea crop is general, and in some measure mitigates the severity of both the two-shift and one-shift rotations. But this kind of cultivation is by no means confined to this county. It has been very general through lower Virginia, and is still to be found in nearly all the lower counties. Nor is the improvement of soil less frequent in Nansemond than in some other of these counties—it is only the more remarkable and condemnable there, because the marl and other manures in that county offer such abundant means for improving the soil and increasing the products. In travelling on the railway, from Portsmouth to Roanoke, I saw not an acre of the numerous and extensive cornfields that seemed to have produced more than 15 bushels—and much the greater part would not have averaged more than 10 bushels. It is true, that the manured spots and best grounds were generally in cotton—but even of these, very few fields, if any, would have brought 20 bushels of corn to the acre. I do not estimate the cost of tillage (at least in Virginia,) half as high as does the editor of the *Cultivator*, who has stated that 30 bushels of corn per acre is the smallest crop that will give any profit to the farmer: but nevertheless, I think that not half of all the fields seen on this route can leave any clear profit on the cultivation.

In Nansemond River are caught immense quantities of fine oysters—and the Indian banks of shells all along the river, furnish testimony that the river has for ages yielded, in abundance this valuable product. On every elevated point on the river, and indeed generally along its banks on both sides, are found spread the prodigious deposites of decayed oyster shells which give the high and well deserved reputation to these lands for fertility, and durability of productiveness under long continued grain tillage of the most scourging kind. I could not learn any certain facts as to the exact length of time during which any particular shelly field had been kept in corn, without rest or manure, and what was its rate of productiveness after such hard treatment. But I found existing a general belief that but few of such lands had escaped 20 or more years of such continued cropping—and on some, the cultivation for 200 years has been never lighter than the two-shift rotation above mentioned, with no more manure than the proprietor could scarcely help making. After all such treatment, these lands, however greatly reduced from their first exuberant fertility, were still what was deemed good and productive soil—and yielding crops that would have given the character of *rich* to any land producing such, in the south-eastern counties, away from tide water.

Having no leisure for more extended observations, I visited only Stockley, the farm and residence of Wills Cowper, Esq. which was the site of the principal town of the Nansemond tribe of Indians, and of whose separate huts, the ground still affords testimony of the localities, in the greater abundance of the shells, swelling above the general level at each spot where the surface had not been moved, otherwise than by ordinary tillage. Just opposite in the river is Duplin (now called Dumplin) Island, the former residence of the kings of the Nansemond tribe of Indians. This island contains about 14 acres of high lands, and a considerable body of marsh.*

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* This island, and the western shore, on which stood the Indian town, and the abundant product of the large corn fields thereon, are mentioned in the following passage in Smith's History of Virginia. The incidents occurred in Sept. 1608, during Captain Smith's second expedition of discovery of the waters of Chesapeake Bay—in which adventure he was accompanied by 12 men only. See *Trve Travels, Adventures*, &c. ch. vi.

"In a fayre calme, rowing towards Poynt Comfort, we anchored in Gosnolls Bay, but such a suddaine gust surprised vs in the night with thunder and rayne, that we never thought more to haue seene Iames Towne. Yet running before the wind, we sometimes saw the land by the flashes of fire from heaven, by which light onely we kept from the splitting shore, vntil it pleased God in that blacke darknesse to preserue vs by that light to finde Poynt Comfort: there refreshing ourselues, because we had onely but heard of the Chisapeacks and Nandsimunds, we thought it as fit to know all our neighbours neare home, as so many nations abroad.

So setting sayle for the southerne shore, we sayled vp a narrow riuer vp the country of Chisapeack;* it hath a good channell, but many shoules about the entrance. By that we had sayled six or seaven myles, we saw two or three little garden plots with their houses, the shores overgrown with the greatest pyne and firre trees we ever saw in the country. But not seeing nor hearing any people, and the riuer very narrow, we returned to the great riuer, to see if we could finde any of them. Coasting the shore towards Nandsamund, which is most oyster-banks; at the mouth of that riuer, we espied six or seauen salvages making their wires, who presently fled: ashore we went, and where they wrought we threw diuers toyes, and so departed. Farre we were not gone ere they came againe, and began to sing, and daunce, and recall vs: and thus we began our first acquaintance. At last one of them desired vs to goe to his house vp that riuer; into our boat voluntarily he came, the rest ran after vs by the shore with all shew of loue that could be. Seauen or eight myles we sayled vp this narrow riuer: at last on the westerne shore we saw large cornfields, in the midst a little isle, and in it was abundance of corne; the people he told vs were all a hunting, but in the isle was his house, to which he inuited vs with much kindnesse: to him, his wife, and children, we gaue such things as they seeme much contented them. The others being come, desired vs also to goe but a little higher to see their houses: here our host left vs, the rest rowed by vs in a canow, till we were so far past the isle the riuer became very narrow. Here we desired some of them to come abord vs, whereat pausing a little, they told vs they would but fetch their bowes and arrowes and goe all with vs, but being a shore and thus armed, they perswaded vs to goe forward, but we could neither perswade them into their canow nor into our boat. This gaue vs cause to prouide for the worst. Farre we went not ere seauen or eight canowes full of men armed appeared following vs, staying to see the conclusion. Presently from each side the riuer came arrowes so fast as two or taree hundred could shoot them, whereat we returned to get the open. They in the canowes let fly also as fast, but amongst them we bestowed so many shot, the most of them leaped overboard and swam ashore, but two or three escaped by rowing, being against their playnes: our muskets they found shot further than their bowes, for wee made not twenty shot ere they all retyred behind the next trees. Being thus got out of their trap, we seised on

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* Now Elizabeth River.—Ed.

These collections of shells, all along the river, are from 2 to 3 feet deep nearest the river banks, and spread back, covering the whole surface, and gradually thinning, so as to form a large portion of all the fields on both sides of the Nansemond: and these original artificial deposites make the celebrated fertile shelly lands. It is but within a few years back that Mr. Cowper and a few others have greatly extended the surface of this kind of soil, by digging down some of the thickest parts of the bed, and carrying the shells, and the rich black earth with which they are always intermixed, to other lands, for manure. This is giving, at the same time, both calcareous and putrescent (or alimentary) manures—and the efforts have been as good as might have been anticipated from such applications, where both kinds of manure were wanting.

It was this shelly soil, and others similar elsewhere, though but little known by personal examination, that furnished to me long ago one of the strongest and earliest proofs of the value and manner of operation of calcareous manures. In investigating the subject at a later period, I obtained from Mr. Cowper specimens of the soil now first seen by me—all of which showed a remarkably large proportion of calcareous matter, though most of it (fortunately) is still in the state of coarse shells, or their fragments. The following statement of the composition of one of them, from the *Essay on Calcareous Manures*, (p. 20, 2nd Ed.) will serve as a specimen of some of the best soil of the Indian Banks.

"Oyster shell soil of the best quality from the farm of Wills Cowper, Esq. on Nansemond River—never manured, and supposed to have been cultivated in corn as often as three years in four, since the first settlement of the country—now yields (by actual measurement) thirty bushels of corn to the acre—but is very unproductive in wheat. A specimen was taken from the surface to the depth of six inches, weighing altogether 242 dwt., which consisted of

126	— of shells and their fragments, separated by the sieve,
116	— remaining finely divided soil.

Of the finely divided part, 500 grains consisted of

18	grains of carbonate of lime,
330	— silicious sand—none very coarse,
94	— impalpable aluminous and silicious earth,
35	— putrescent vegetable matter—none coarse or unrotted,
23	— loss.
500"	

I refrain from stating more particulars of these interesting and valuable shelly lands, because it has been promised that better information on this general subject, and more full details, shall be furnished from a highly respectable source. It is enough here to say that the value of the Indian shell banks as manure, as well as of the marl found in various places, have been used to great advantage on Stockley, as well as on some other river farms.

Wheat is scarcely grown at all in Nansemond, and the shell lands are decidedly unfavorable to that crop, but very friendly to clover—though this grass has but lately been tried, or even supposed capable of being here made. On clover on this shell land, Mr. C. had tried gypsum without any profitable effect. This result is very different from what I had counted on. But there was also another difference in result—and one may serve to explain the strangeness of the other. Though perfectly satisfied that lime in soil, is essential to the sure and profitable growth of clover—and that shells or marl will insure its healthy growth on even sandy and poor land—I had not learned from experience, that calcareous manure alone would sustain *luxuriant* clover, on a sandy soil, even when aided by putrescent manure: though supplying gypsum in such cases, another necessary or specific manure for clover, will generally produce a heavy crop of this grass. But this made by Mr. C. was a very heavy and luxuriant crop, without gypsum—and was no better where it was applied. I infer that nature had somehow supplied the soil with gypsum in sufficient quantity—which supposition will serve to explain all the results.

The farms on the banks of Nansemond River are in every respect, save one, most desirable as places of residence, as well as for agricultural profit. That exception is their being very subject to the only disease that has peculiar or much power in lower Virginia—autumnal fevers, the effects of malaria. I am loath to believe the cause of these diseases to be beyond human control. It is not probable that the neighboring salt marshes are the source of this evil, because in other parts of lower Virginia, in the neighborhood of other marshes apparently precisely similar, the country is comparatively healthy. So far as malaria emanates from the dry land, (as no doubt it does wherever circumstances are favorable to its formation,) there is little doubt but that this source may be closed up by the general and sufficient application of marl, or other calcareous manures. The great

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all their canowes, and moored them in the midst of the open. More than an hundred arrowes stucke in our targets, and about the boat, yet none hurt, onely Anthony Bagnall was shot in his hat, and another in his sleeue. But seeing their multitudes, and suspecting as it was, that both the Nandsamunds and the Chisapeacks were together, we thought it best to ryde by their canowes a while, to bethink if it were better to burne all in the isle, or draw them to composition, till we were prouided to take all they had, which was sufficient to feed all our colony: but to burne the isle at night it was concluded. In the interim we began to cut in peeces their canowes, and they presently to lay downe their bowes, making signes of peace: peace we told them we would accept it, would they bring vs their kings bowes and arrowes, with a chayne of pearle; and when we came againe giue vs foure hundred baskets of full corne, otherwise we would breake all their boats, and burne their houses, and corne, and all they had. To performe all this, they alleged onely the want of a canow; so we put one a drift and bad them swim to fetch her: and till they performed their promise, wee would but onely breake their canowes. They cryed to us to doe no more, all should be as we would: which presently they performed, away went their bowes and arrowes, and tagge and ragge came with their baskets: so much as we could carry we tooke, and so departing good friends, we returned to Iames Towne, where we safely arrived the 7. of September, 1608."

sources of autumnal diseases in lower and middle Virginia, is more likely to be found in the mill ponds—and these are abundant along, at least, part of the sickly borders of this river. If the meeting of salt and fresh water is a fruitful source of malaria, or the spreading of salt water over fresh marshes, (as stated in an article in the last number of the Farmer's Register,) then the discharge of floods of accumulated water, after heavy rains from these mill-ponds, may, by overflowing the adjacent salt marshes. produce much of these deplorable results, in addition to the universal extrication of malaria from the ponds themselves, when lowered by summer droughts. The pestilential emanations thus produced from mill-ponds, and from the discharge of their floods upon salt marshes, may thus serve to produce much the greater part of the autumnal diseases so prevalent on the banks of this river. The remedy for this great evil will only be found in the general abatement of the greatest physical nuisance in our country, viz. mill-ponds on small or insufficient streams. As to the smaller amount of such disease justly attributable to emanations from the general face of the country, it would be greatly limited, if not annihilated, by that kind of manuring which would most redound to the profit of the farmers, in other respects as well as in preserving health. Such has been the undoubted result on farms and in neighborhoods in Prince George, where marl has been extensively applied. But it is evident, that to derive this benefit fully, all the lands of the neighborhood, whether in wood, meadow or arable, should be made calcareous on the surface.

The salt marshes in this neighborhood are generally high and firm, and rarely covered by tides. The growth is of different kinds of salt grasses, which are excellent food for cattle in the spring, and beginning of summer, but which become unfit afterwards. If this is (as is alleged) from the older state of the grasses, it might be prevented by mowing the marshes, and thus providing a young and tender growth in the latter part of summer. The kinds of grass which grow on these marshes affect that locality more because of its saltness than its wetness. As a proof of this, I saw the same kind of grass, of good growth, covering the lofty ramparts of the fortress at Old Point Comfort, though the marsh mud which had been used to construct them, had been for years in this very dry situation.

Marl has not been in use but a few years in Nansemond county, nor is it now used to much extent, or by many persons, compared to the great number who have it in their power to profit well by this manure. I saw, as well as heard of, striking improvements made by marling, on the farms of Mr. J. T. Kilby, Mr. Mills Riddick, sen. and Mr. J. Bunch, all in the neighborhood of Suffolk. But still, the example of these gentlemen has had but little effect in stimulating, or even awakening their torpid countymen. Some persons went zealously, but not judiciously to work: they put rich marl on poor land in quantities far too heavy; and having thereby injured their land, they have taken no means to correct the error. They are content to abandon marling, and to stand by their first fruits of it, as full evidence of its worthlessness, or the danger of using it.

This county is celebrated for its crops of very fine sweet potatoes; and on some of the lower river lands, water-melons are a considerable and very profitable field crop. They are sent by vessel loads to the northern cities. For such distant markets, they are gathered before they are quite ripe, and therefore never can be of as fine flavor as when left to ripen on the vines. The greater part of the sweet potatoes are sent to the northern markets.

The former owners of farms on Nansemond River have generally lived in the exercise of what has been so much lauded as "old Virginia hospitality"—and which deserves more to be reprobated, as the system or habits that have tended more than any thing else to ruin the estates and their owners, or their children, throughout lower Virginia. I speak not in condemnation of true hospitality, but of its excess and abuse. According to the long established precedents in such cases, few of the lands on the Nansemond, are now held by the children of former possessors—and still fewer by the same individuals who held them twenty years ago. A contrast to this state of things is exhibited by the people who cultivate the poor lands of the "piney woods." Deprived of all the comforts and luxuries furnished by the river, and compelled by the difficulties of their situation to be laborious and frugal, they have prospered in their estates, in spite of poor lands and a wretched system of agriculture, as much as their richer and more favored countymen have done otherwise. They live plainly, but comfortably, have no fear of the sheriff before their eyes, nor anticipations of leaving their children in want, or dependence—and are able to exercise, and doubtless do exercise, true and kind hospitality, without ostentation, and without the waste of the entertainers' time and good habits, still more than of his victuals and drink, on idle loungers and dissipated companions and visiters.

It was stated in the early part of these remarks that the low state of agriculture in this and the counties lying to the east, was inexplicable. But the reasons given for it will serve as a partial explanation. The main one is the inducements held out to capitalists, and still more to poor men and laborers, to get timber for market, rather than to till the earth for slower-coming gains. The immense quantity of excellent timber in these counties has afforded occupation, in getting it up for market, to any amount of labor: and the northern demand for shingles, and that of the navy yard in Portsmouth, and the works at Fortress Monroe, for every other kind of building and ship timber, have offered ready and profitable markets for all the products of labor thus directed. Even though the general and average returns of this and agricultural labor had been equal, the latter would be received only after a year's time (at shortest,) while a load of timber could be cut and sold in a few weeks. But the profits of the timber business were the best. Besides—the great public works long carrying on at the navy yard and the fortifications required a great number of ordinary hands, for which enormous hires have been always paid. This served to take away from agricultural labor much of its proper laboring force—and induced the owners of labor and capital to look to other sources of profit than cultivating or improving the soil. These advantages, have had evil, instead of good effects.

THE PEAT SOILS OF SCOTLAND, COMPARED WITH THE JUNIPER SOIL OF THE DISMAL SWAMP.

[The writer of the following answer, though in the humble station of overseer of a farm, is an intelligent and well read agriculturist as well as a hard working and practical one. Supposing that he must be, from personal observation, well acquainted with the peats and peat soils of his native country, Scotland, and therefore could correctly judge of the points of difference or of agreement between them and the soil of the Dismal Swamp, a large unbroken specimen was sent to him for that purpose, of the juniper soil, including both super and sub-stratum, and also the cover of plants found growing thereon. It was from the sub-stratum of this parcel that the specimen No. 4, was taken, which was stated at page 520, to lose 96 per cent. in bulk of vegetable matter, by burning.—Ed]

To the Editor of the Farmers' Register.

Coggin's Point, December 4th, 1836.

I have examined the specimen of soil from the Dismal Swamp, which you sent to me, and shall endeavor to point out the very close resemblance which it bears to the peat soils of Scotland. To make myself more easily understood, I shall describe the different varieties of peats, or peat soils, as they occur in Scotland, founded upon the practical uses made of them, and the different degrees of decomposition in which the vegetable matter is generally found.

The first kind is the solid true peat, or turf, a mass of decayed vegetable matter, sufficiently firm to cut easily with the spade into pieces, of the size and shape of common bricks, or larger, and which, when sun-dried, are ready for fuel. This solid mass often occurs of very considerable depth. I have often seen it upwards of four feet deep.

The second kind is a similar mass of vegetable matter, only in a state of greater decomposition, and after being dug out, requires to be baked or compressed with the hand into small cakes called "peat pies," before they are laid out to dry for fuel.

The third is the more perfectly decayed vegetable matter, entirely unfit for fuel; this generally underlies the two former, and often occurs of very great depths. In most of the peat mosses, (swamps,) it is in nearly a fluid state—and a person walking on the comparatively firm surface, even in dry seasons, will cause the earth around him for a considerable distance, to vibrate at every step. This, very nearly pure vegetable matter when deprived of its superabundant water, is frequently used in a compost with lime as a top-dressing on pasture fields, and is also much used in composts by nurserymen and horticulturists in raising many plants, particularly heath from the south of Africa, and many plants from this country, such as kalmias, azaleas, rododendrons, &c.; some deposites of this contain a considerable portion of ferruginous matter.

This specimen of soil from the Dismal Swamp resembles all the kinds in color, but can hardly be said to present any other resemblance to the first. Decomposition in this country, I presume, takes place too rapidly to admit of such a formation. But all of the specimen of surface soil (about six inches deep,) above the slimy mud, presents a very close, if not identical resemblance to the second kind above described, and in Scotland, would be termed peat earth. In burning, it presents the very same appearances, and emits while burning the same strong, but not disagreeable smell—a smell distinct from that of any other among vegetable matter with which I am acquainted, and which adheres tenaciously to every thing with which it comes in contact. When used as a fuel in the distillation of spirits, it imparts to the spirits the same peculiar flavor, and it is generally much esteemed.

The specimens of cryptogamous plants accompanying the soil, particularly the mosses (*Musci*) are the same, or at farthest, only different varieties of the same species, as are indigenous to every peat moss in Scotland. In the specimen of these were a few dried leaves of fern, (*filices,*) and which from its appearance, I judge to be the nephrodium lobatum, which though not growing extensively in the peat mosses of Scotland, is to be found in the neighborhood of springs in sheltered situations on soils of this nature. In wet and swampy situations in this country, I have seen many plants of the sweet gale (*myrica gali*) growing, and which also are plentiful on some of the peat soils of Scotland—with this difference, that in this country they are indeciduous, in Scotland they are deciduous; and I presume, the same plant abounds in the Dismal Swamp.

The masses of vegetable matter in the peat mosses of Scotland consist principally of a great variety of mosses—a few only of the fern tribe, which require more silex for their growth than is generally to be found in the real peat mosses—large quantities of coarse grasses also abound, these decaying more rapidly than the other species of plants, appear to form the principal earthy ingredient found in the true peat. The heath which principally abounds in such situations, is the *erica vulgaris*. Altogether these peat mosses present a barren, naked and cheerless aspect.

These peat mosses though generally considered as resting on a gravel bottom, are not without many exceptions: the bottoms of some of them, which have been reached, rest on a stiff tenacious clay. An extensive peat moss near Sterling, from which a great portion of the peat soil has been removed, presents this latter appearance, and is now becoming a rich and productive soil. The agent employed in removing this soil was water, aided by having ditches or canals cut where necessary. The almost incredible masses of this species of soil thus removed and carried by streams of water into the river Forth, and becoming united with other alluvion, has been the means of forming some rich alluvial deposites on the shores at the head of the estuary of the same name, into which that river empties itself. In one place, a farm of considerable extent has thus, with the aid of embankment (so formed as to admit the flow of the tide, and to retain the alluvial matter contained in the water,) been formed; and what was less than twenty years ago a bay covered by the waters of the German Ocean, is now a rich and fertile soil. In some instances, these peat mosses cover soils to a great depth, which at an early period, appear to have been covered with forest trees of large size, many of which are frequently found, and some oaks in a state of excellent preservation.

The soil of the greater part of the heath-covered land in Scotland, is generally termed peat earth, but which differs considerably from the peat moss. It is much less spongy, and much more mixed with the other common soils, and fewer of the mosses grow on this soil, than on the peat mosses. Ferns grow abundantly: the most common are the *polypodium vulgare*, *pleus aquilina*, or brake, *scolopendrum officinarum*, &c. Heaths in this soil grow luxuriantly, principally the *erica vulgaris*, *herbacea*, *dumosa*, with many sub-varieties. Some of the Myrtle family are also plentiful, such as the *vaccinum myrtillus*, or black berry, *vaccinum vitis idœa*, or crowberry, &c. the grasses on this soil are also of a coarse quality, but afford tolerably good sheep pasture. This soil in some situations is comparatively easily improved, by paring. burning, and the use of lime, &c. and which speedily makes the soil undergo an entire change.

From what I know of the different peat soils in Scotland, and from a careful examination of this specimen from the Dismal Swamp, I believe myself warranted in saying, that it is what in that country, is termed peat soil, earth, or moss. I have never before seen any such soil in this country.

A. NICOL.

From the (British) Quarterly Journal of Agriculture.

ON MOSS IMPROVEMENTS.

By Mr. A. Blackadder, Land-valuator and Surveyor, Allan Park, Stirling.

Much has been written upon Moss as an agricultural soil, and many will be ready to conclude that nothing farther can be brought forward worthy of attention. Men of the first-rate talents and of extensive acquirements have studied its chemical qualities, and with every opportunity for observation and investigation, have, without prejudice, recorded facts. Agriculturists of enterprise and skill have made experiments with a view to reclaiming or improving mosses; yet, after all, on no subject are opinions more at variance. Theory is opposed to theory, facts opposed to facts, and experiments present the most opposite results. It is natural to ask, how is this? I am disposed to reply, that the true and only cause is, that little or no attention has been paid to the different kinds of moss; and this seems evident from the circumstance that none of the writers on the cultivation of moss give a full description of the nature and quality of the moss treated of, as if all mosses were the same; than which there cannot be a more fatal mistake, owing to which much money has most unprofitably been expended, and on account of these manifold failures, many have been deterred from attempting moss improvements, where the result would have been highly advantageous. This is a consequence not less to be deplored when we consider what a vast extent of the surface of the three kingdoms is under moss, and that its baneful effects are severely felt on the adjacent crops, from the cold and humid atmosphere which its presence engenders; for who does not know that in very few seasons will even oats or potatoes come to maturity in the vicinity of moss; and that, in our best seasons, they are inferior, owing to the early frosts rendered more intense by copious evaporation.

It is therefore proposed to state some things essential to be kept in view before entering upon moss improvement, viz. The subsoil—the order of the super-position—the comparative thickness of the subordinate moss strata, and their diversified composition—the state in point of humidity and capacities for drainage—proportion of commixed earthy matters—superficial alluvial depositations—substances acting as decomposing applications—the nature and uses of the adjacent rocks and their earthy covers—and the prospects of improvement.

Subsoils of Moss.—These formed the common surface soil prior to the growth of the moss, and are as diversified as can be supposed. If they are deep and rich, and the superincumbent moss of a moderate depth, the most lucrative course, where other circumstances concur, is to float off the moss entirely, and cultivate the subsoil, as has been done to the extent of some thousand of acres in the Vale of Forth, in Scotland; but if it cannot be floated off, and is only one or two feet in depth, a similar permanent improvement may be effected by ploughing and burning, until the subsoil is reached. Again, if the moss is shallow, and the subsoil sand, or such like inferior soil, the best improvement is a top-dressing of one or more inches, to be obtained by casting out the subsoil from parallel ditches, and, however poor the quality, it will decompose the moss, and produce a good pasture. But another reason for examining the subsoil is, that the richer it is, other things being equal, the richer the nature of the plants which it originally produced, and also that of the subsequent peat earth. Nor should it be forgotten, that not unfrequently the subsoil of moss is a valuable shell marl.

Composition of Moss Proper.—Every one at all conversant with moss, knows the worthlessness of "flow moss" (the produce of Sphagnum, Hypnum, &c.) either as a soil or for fuel, and it is indeed the most indecomposible of plants of so soft a texture; unhappily it is of all others the most prevalent in the less elevated mossy grounds. If, therefore, it forms the surface cover, any prospect of a high degree of fertility must necessarily be distant; but if it be covered by a stratum of decayed heath, bent, cotton grass, &c. the quality of the moss soil is much better. Other mosses are chiefly composed of reeds (arundo.) horse tail (equisetum,) trefoil (menyanthes trifoliata,) sedge (iris,) rushes (juncus,) &c. such more readily decompose, and form a much richer soil than either of the former. Nothing so well determines the quality of moss as the plants which it spontaneously produces; for the moss soil and its products are nearly of the same substance, and the crop of the preceding years is the soil in which the next crop vegetates. Again, the moss plants now vegetating, indicate the degree of moisture; for so soon as a permanent saturation is effected, the sphagnum, &c. is produced to the almost total exclusion of the other plants; but on the water being drawn off its dies, and is succeeded by heath and sundry coarse aquatic grasses; or, if rendered sufficiently dry, bent grass prevails. If decomposition is by any means effected, then rushes, and also the finer pasture-grasses, supplant the latter. While moss plants continue still to grow, it is evident that the depth of moss must be still on the increase, and this by reason of the antiseptic qualities of its products; but where by any means pasture-grasses, or even rushes, abound, it is manifest that the proper moss is in a state of decay, decomposition has commenced, and a very different soil is presented, and of course a different treatment is called for. Had these circumstances been brought under notice by writers on moss improvement, not only would their conflicting statements have been avoided, but immense sums saved, or applied usefully and to permanent advantage, which oftentimes have been worse than thrown away.

Depth, Humidity, and Draining.—Mosses of great depth, or vertical thickness, and having a nearly level surface, are generally more elevated, softer, and more fluid towards their central portion. It is a common practice to encircle them with a main drain, which indeed prevents flooding from higher grounds, but has little or no effect in draining the area of the moss field. The main drain should invariably pass through the centre of the softest or deepest part of the moss; and although that should be the highest, it will very soon become the lowest, and produce a subsidence and inclination towards it, on all sides. It is commonly objected to this course, that the moss is too soft to admit of it; and, indeed, if the drain is at the outset made more than one foot in depth, the matter thrown out will soon press the sides together, or even cause the bottom to swell up. This difficulty is, however, not insurmountable, if operations are carried gradually, and if at the same time with the main drain, smaller ones are led off from it, at right angles, in parallel straight lines, and only made deeper as the moss consolidates. In the vicinity of a large river, or of the sea, the whole excavated moss of the principal drains may better be floated off; and where too elevated to admit of a stream of water being brought over it for that purpose, the main drain may be deepened for a time, merely by the rain water collected on the surface. This course was effectually employed in a drain a mile and a half in length, in Blair Drummond moss, in Pertshire, under the eye of the writer, and under the direction of his father. The moss was eighteen feet deep, and so soft that boards were necessary even in the dryest season to support the feet from sinking when only walking over it; and indeed on one occasion it burst out and covered many acres of the adjoining arable plain, and surrounded several houses, surmounting every obstacle adopted to obstruct its course. Whatever be the nature of moss, it is on all hands agreed that no improvement can be made without draining. Yet it must be a primary consideration, whether, under all circumstances, the expense even of draining would be well bestowed, although, were even the pernicious effects on vegetation and animal life included in the estimate; yet on the latter account, it is most desirable that all mosses were effectually drained. The facilities for this purpose ought indeed to be among the first inquiries, and that not merely whether there is a superficial inclination, such as might be sufficient for draining other soils, but also making allowance for the subsidence of the moss, consequent on draining, which may average one-fifth of its depth. If there be a permanent stream through the main drain, liable to occasional increase, allowance must be made so as it may be sufficient to contain the whole, and thereby avoid all flooding; but otherwise no drain in any kind of moss need exceed four or five feet in depth, and for covered drains a depth of three feet is quite sufficient. These being straight, and parallel to each other, and discharging into larger subdivisional drains, and being distant from each other from twenty-four to forty-eight feet, according to the nature of the moss, will in general be found quite sufficient. There is no danger of over-drying moss by draining; but there is much danger of this being done by trenching; moss should never be stirred for cropping to a greater depth than eight or nine inches.

Manures, &c. for Decomposing Moss.—Adjacent rock strata ought to be carefully explored, as in general they have each their corresponding earthy covering more or less adapted to the purposes of vegetation. Where the rocks are of the primitive class, or of the coal formation, their disintegrated portions, and oft-times their superficial covers, are of inferior value as a soil; but even the rock earth of the latter, as also of clay-slate, lime, or even the old red sandstone, though not previously mingled nor superimposed in the moss, are yet valuable as ingredients of composts for top-dressing; as are also those of the purer sandstone, greenstone, and sea sand, containing calcareous matters in a state of decomposition, or even when these are absent. While sand laid over moss produces rapid decomposition, and consequent vegetation, no such effect is produced by the purer clays. Putrescent matters, whether animal or vegetable, possess the most powerful influence. Lime, unless in compost, seems to have no such effect on simple mosses; and its effects on mixed mosses, or those in a state of partial decomposition, must depend on the quantum of foreign matter and other circumstances. Examples might be given in illustration, and also of numerous failures in moss improvements, which have nevertheless been lauded as if attended with complete success. Regarding these and some other matters, a future opportunity may perhaps be afforded for offering further remarks.

Prospects of Advantage by Improvement.—The value of moss greatly depends on local circumstances; and particularly with regard to the supply of operatives at the commencement of improvements; access to putrescent manures; markets for the sale of the produce; soils affording materials for top-dressing; and turf suitable for wedge-drains; or for drain tile, or stone for drains, or clean gravel if found preferable; the expense at which these can be laid down at the moss must enter into the calculation. Or, again, if the moss is to be entirely removed, whether an adequate supply of water can be obtained with access to a river or to the sea into which it may be floated off. Nothing adds more to the intrinsic value of moss than mixtures of other soils during the progress of its formation, either by means of the winds carrying drift sand, or by water transporting earthy particles. When, again, a considerable quantity is thus superimposed, the soil ceases to be a moss, properly so called, and is an alluvial soil upon a moss subsoil. In either case little more is required than thorough draining, in order to the production by ordinary means of the best crops; and such is the description of the greater part of the mosses hitherto successfully improved in Scotland. There are, however, more of this description of mosses than is generally supposed, for the commixion of foreign materials is not easily detected by the eye, excepting by the inspection of dried portions in a strong light after being recently broken across, when the minute siliceous particles become sufficiently apparent.

N. B.—The obvious results, merely, of the addition of siliceous sands to mosses, have been brought under notice in the preceding remarks. Were the principle upon which the sand operates satisfactorily determined, it would doubtless form a valuable acquisition to agricultural science.

A Cultivated Moor.—The following is a sketch of an attempt to cultivate a moor, dashed off by a hand, the productions of which can never be mistaken. The moral of this graphic picture is, that there is a wrong as well as a right way of improving a moor.

The Moor.—It was then ever so many miles long, and ever so many miles abroad, and nobody thought of guessing how many miles round; but some dozen years ago it was absolutely measured to a rood, by a land-louper of a surveyor—distributed—drained—enclosed—utterly ruined forever. No—not forever. Nature laughs to scorn acts of parliament, and we predict that, in a quarter of a century, she will resume the management of that moor. We rejoice to hear that she is beginning already to take lots of it into her own hands. Wheat has no business there—and should keep to the carses. In spring, she takes him by the braird till he looks yellow in the face long before his time—in summer, by the cuff of the neck till he lies down on his back and rots in the rain—in autumn, by the ears, and rubs him against the grain till he expires, as fashionless as the winnle-straes with which he is interlaced—in winter, she shakes him in the stook till he is left but a shadow, which pigeons despise. See him in stack at Christmas, and you pity the poor straw. Here and there bits of bear or bigg, and barley, she permits to flourish: nor is she loath to see the flowers and shaws and apples on the poor man's plant—the life-sustaining potato—which none but political economists hate, and all Christians love. She is not so sure about turnips, but as they are a green crop, she leaves them to the care of the fly. But where are our gowans gone?' There they still are, in flocks which no cultivation can scatter or eradicate—inextinguishable by all the lime that was ever brought unslokened from all the kilns that ever glowed—by all the dung that was ever heaped, fresh and fuming from the Augean stables in the land. Yet her heart burns within her to behold, even in the midst of what she abhors, the large dew-loved heads of clover whitening or reddening, or with their rival colors amicably intermingled, a new birth, glorious in the place of reedy marish or fen, where the cat's-paw nodded—and them she will retain into herself when once more she rejoices in her Wilderness Restored. And would we be so barbarous as to seek to impede the progress of improvement, and to render agriculture a dead letter? We are not so barbarous—nor yet so savage. We love civilized life, of which we have long been one of the smallest, but sincerest ornaments. But agriculture, like education, has its bounds. It is, like it, a science, and woe to the country that encourages all kinds of quacks. Cultivate a moor! educate a boor! First, understand the character of clods and clodhoppers. To say nothing now of the urbans and suburbans—a perilous people—yet of great capabilities; for to discuss that question would lead us into lanes; and as it is a long lane that has never a turning, for the present we keep in the open air, and abstain from wynds. We are no enemies to poor soils, far less to rich ones, ignorantly and stupidly called poor, which under proper treatment effuse riches; but to extract from paupers *a return* for the expenditure squandered by miserly greed on their reluctant bottoms cold and bare, is the insanity of speculation, and such schemes deserve being buried along with their capital in quagmires. Lord! how they—the quagmires—suck in dung! You say they don't suck it in—well then, they spew it out—it evaporates—and what is the worth of weeds? Lime whitens a moss; that is true, but so does snow. Snow melts—what becomes of lime no mortal knows but the powheads—them it poisons, and they give up the ghost. Drains are dug deep now-a-days—and we respect Mr. Johnstone. So are gold mines. But from gold mines that precious metal—at a great expense, witness its price—is exterred; in drains that precious metal, witness wages, is interred, and then it becomes *squash*. Stirks starve—heifers are hove with windy nothing—with oxen frogs compete in bulk, with every prospect of a successful issue; and on such pasturage where would be the virility of the bulls of Basham?

MODE OF EXACTLY REPRESENTING LEAVES.

To the Editor of the Farmers' Register.

Petersburg, Nov. 28, 1836.

Dear Sir,—In a note in the introductory part of Mrs. Lincoln's Botany, there is a recipe for taking the impressions of leaves. It is to smoke a sheet of oiled writing paper over a candle, until a sort of unctuous ink is formed—to apply this ink to the interior surface of the leaf, and then to press this *inked* surface on a clean sheet of thin letter paper. I tried this plan, and found it successful, but it was tedious and troublesome—since one blackening of a sheet would answer only for a very few leaves, and the repeated oiling of the paper jeopardized one's dress.

It occurred to me, that printer's ink would answer the purpose. I procured a small quantity of this article from the office of the Register, and had two small *dabs*, as I call them, made of cotton, covered with an old glove, the handle being a small wooden thread-spool sewed in. With this apparatus, I applied the ink to the leaf, and pressed it with a book, and I found the impression exact and beautiful. My next step in improvement, was to fasten two pieces of thick board together, by means of leather hinges—a primitive printing press.

A more complete and elegant machine, however, would be a merchant's letter press—which, when used in printing leaves, might be called the *leaf press*.

In towns, however, I agree with you, a printing press would be the best, and ready to the hand. By means of this machine, fifty leaves might be printed at once, and by inking both sides of the leaves, duplicate impressions might be made each time—one of the upper, and the other of the under side, which would make the number of impressions a hundred, and the same leaves from one inking, might be printed a number of times; and by *re-inking*, might be struck off "ad infinitum."

This mode of delineating leaves is preferable to any other, because it gives the very *fac simile* of nature—the veins, the outline, the very grain and texture of the leaf—and, perhaps, by coloring the ink, the image of the leaf might be exactly given.

In this way, students of botany, may preserve impressions of the many thousand species of leaves, and travellers may adorn their *porte feuilles* with the foliage of the prairie, and the forest; and the daughters of our country-gentlemen may thus agreeably occupy the leisure of a summer morning in copying the beauties of nature, by a mode the least expensive or laborious, and the most exact and faithful, that can possibly be used.

I forgot to mention, that the outside quires of letter paper will answer perfectly well, and that when printed, a number of sheets stitched, make a leaf-book—a pretty ornament of the parlor; and, also, your suggestion that the paper ought to be dampened, by dipping the whole quire into a vessel of water, that it may the better absorb the ink; to which I will add, that, perhaps, printing paper would be the most suitable for this purpose—and, lastly, that what it takes so long to detail, is a perfectly simple process, and may be done in a minute.

Your obedient servant C. C.

For the Farmers' Register.

THE PORTSMOUTH AND ROANOKE RAILWAY. THE NAVIGATION OF THE MEHERRIN, NOTTOWAY, AND BLACKWATER RIVERS.

By the Editor.

The Portsmouth and Roanoke Railway route, as far westward as the Meherrin, is remarkably level—and of course the trains are propelled with proportionable facility, and diminished expenditure of power. It is, indeed, an admirable track for its general straightness, no less than its level course. But still there were great causes of difficulty and expense in the first construction, and so will there continue to be in future repairs. The country is low, and the streams passed are bordered by swamps or low-grounds, which required long bridges elevated on sustaining posts and framed timbers. All these bridges remain uncovered, except the one across the Blackwater, and of course their decay will be rapid, and very costly repairs will soon be necessary. After passing the Meherrin, the route is quite undulating, and generally ascending to where it crosses the Petersburg railway, less than two miles from the southern termination of the latter, at Blakely on the Roanoke.

I took my seat in the train at Suffolk, for the intersection near the Roanoke, there to take the Petersburg train, as the shortest way to reach the latter town. And circuitous as is the whole route thus passed over, I travelled the 118 miles from Suffolk to Petersburg in 9 hours—including all the stoppages, except one, of half an hour, between leaving the Portsmouth train and the arrival of the one for Petersburg. If the two companies would agree in their hours of arrival and departure, so as to permit such a journey always on stated days, (as might be done without inconvenience,) and the arrangement was made known, there would be many persons who would come by the two railways from Norfolk to Petersburg, rather than wait one, and sometimes two days, for a passage by the steamboats.

Both these two great railways cross the Meherrin and Nottoway rivers below their falls, and the Portsmouth road also crosses the Blackwater river—and this last, and that only below the railway, is alone made any use of for navigation to bring country produce to be put on the railway, for market. And it is probable that no such use would have been made of the Blackwater, for boats bringing crops made in the neighborhood, but for their being shown the way, by this being made a regular steamboat route from Edenton, and by which much cotton is brought from North Carolina, to be sent by the railway to Norfolk. The almost total disuse of these three easily navigated rivers, is one of the most remarkable instances of the inveteracy of long established habits in our countrymen, and the slowness with which they adopt improved facilities, when offered to their acceptance. These three rivers, though small, flow over very level beds, and would require but little labor and expense to be made navigable for flat boats for distances which combined, would make at least 120 miles, without including the Chowan, formed by the junction of the Meherrin and Nottoway, which is now used for navigation. The length of the Meherrin, from the lowest falls to where it unites with the Nottoway, to form the Chowan, is more than 60 miles, as measured on the map. The Nottoway, from its lower falls above the Petersburg railway, to the point of junction just named, is more than 40 miles—and the Blackwater from the southern line of Surry county, to where that river joins the Nottoway, is 20 miles.

From above the Petersburg railway, there are no falls, or rocks, in either the Meherrin or Nottoway—nor, indeed, any obstruction to downward navigation, except trees fallen by accident, or more generally by design, into the streams, and which, if sawed into pieces at low water, would all be swept away, together with the rafts and sand bars which they have served to form, by the first freshet. It is true, that these streams are very low in summer droughts: but the crops of the country (cotton and corn,) are seldom ready for market before the streams are full—and the timber which this navigation would bring into use, and make valuable for market, might wait until the water was sufficiently deep for its transportation. The Nottoway lands are among the most productive in the counties of Sussex and Southampton—and its passing through the heaviest producing region, is another reason why this river should be used for navigation. But because these waters led to no suitable market before, and because every farmer has always been in the habit of sending his crops to market by his carts or wagon, no one thinks yet of taking the far cheaper way of boats to either of the railways. Meherrin and Nottoway might doubtless be profitably improved and navigated far above their falls, as routes to the upper railway: but it would be idle to urge *that*, while the advantages offered by their far better waters below the falls are overlooked, and almost totally neglected.

It has been a long time since the attention of the writer of these remarks was attracted to the peculiar circumstances of these waters, and the advantages that might be derived from bringing them into use. To induce others more interested, and having more local information, to think upon that and other kindred subjects, the subjoined "Hints and Queries," were published in 1825; which may now furnish some amusement, if nothing more, by the strong contrast displayed of the condition of things, and of prospects, then and now. If the reader, at this time, should condemn the scheme then proposed for bringing these natural canals into use, as altogether absurd and ridiculous, (as it certainly would have been, if the present state of improvement could have been anticipated,) let it be remembered, that at that time no one had thought of constructing rail roads in this region—nor establishing the now prosperous cotton and other factories, which will be so increased in time, as to require as much of the water of the Appomattox, as then run in waste down the falls. For these two great improvements, the country owes much to the enterprising spirit of Petersburg—and to the fortunate results of these bold but judicious adventures, Petersburg owes her present and fast growing prosperity, which stand is such marked contrast to the state of decline which seemed progressive as late as when this piece was published. But the writer was not more in the dark then, as to the near approaching revival of the prosperity of Petersburg, from the railway and the factories then not planned, than he was in supposing that furnishing a proper outlet to the three rivers would bring them into use. They have now better outlets than he then supposed possible to obtain—being intersected, in five different places, by rail roads furnishing speedy and cheap conveyance to two different market towns: and yet these rivers are almost as little used now, as before the construction of these great works.

ON THE WANT OF UNIFORMITY IN THE STATED VALUES OF FRENCH AND OTHER WEIGHTS AND MEASURES.

To the Editor of the Farmers' Register.

Columbia, South Carolina, Nov. 23, 1836.

Dear Sir,—I should have replied to your letter before, but have been confined by violent indisposition and unable to work. I had mustered about twenty books of authority, for the purpose of drawing up a paper on the discrepancies of the system of weights and measures, published in our elementary books, deemed of authority on the question: but as you seemed to decline my offer, by taking no notice of it, I took no further trouble, and distributed my authorities, which I fear I shall not find leisure to collect again and compare.*

As a specimen, however, of the necessity of such a paper, I send you the following memoranda.

According to Dr. Redman Coxe, Dr. Gregory, Mr. Renwick and others, the French gramme is stated at 15414 troy grains, and the kilogramme at 15444 grains, whereas, the true number is 15434 grains. See the mistake explained in 1 Kelly's Cambist, p. 140, (2nd edit. 1821.) I wonder Mr. Renwick, whose useful little book, "Compendium of Mechanics," was published in 1830, should not have been aware of this mistake.

None of these popular compilations give you the barometrical and thermometrical degrees, at which the numbers are taken.

Again—A cubic inch of water, barometer at 29.5, thermometer at 60° of Fahrenheit, will weigh, according to Dr. Geo. Shuckburgh, 252.506 grs.

By Dr. Henry, of Manchester,	252.52
By Dr. Paris,	252.72
By act of Parliament, 5, Geo. 4, ch. 74, at 62° Fahrenheit,	252.458
By Mr. Hasler, (Report, 1832,) at 40 (Fahrenheit,)	252.7
Average	252.5916

So, Mr. Hasler, in his report to our Secretary of State, 1832, makes the metre 39.380, instead of 39.371. I suspect this is a typographical mistake for 39.370, at 32 of Fahrenheit.

By law (of all the old thirteen states, New York excepted,) the standard bushel is the Winchester bushel of 18½ inches diameter, by 8 inches deep, containing 2,150.42 cubic inches. The half bushel will, therefore, be 18½ by 4 inches. The model bushel kept in the Department of State, at Washington, holds (according to Hasler) 467,681.6 grains at 39.83 of Fahrenheit by actual measurement, and is therefore less than the legal Winchester bushel, by 75,294.4 grains, or 156.8 ounces, neglecting allowance for difference of temperature. The Winchester bushel at 62 Fahrenheit, contains 1131.89 ounces.

The present imperial bushel of England, contains (5 Geo. 4, ch. 74,) 2218.192 cubic inches, and holds exactly 80 lbs. avoirdupois of distilled water: that is, 560,000 grains; the troy pound being 5,760 grains, and the avoirdupois pound, 7,000 grains. So that the present imperial bushel, is to the Winchester, as 1.031 to 1.

It appears from the reports of Mr. J. Q. Adams, and Mr. Hasler, that the whole system of weights and measures throughout the United States, is irregular and inaccurate. The specimens kept at the custom houses of the seaport towns, and in the office of the Department of State, disagree with each other, and with the legal weights and measures. By *legal*, meaning those in use in England, before 5 Geo. 4, ch. 74, and adopted by the statutory enactment in all the old states. The alteration made by New York, has *no merit of any kind.* Had New York adopted the present imperial weights and measures of Great Britain, which possess all necessary practical accuracy and convenience, (Capt. Sabine's objections notwithstanding,) the weights and measures of England and America would coincide. This I recommended in a tract distributed at Congress, in 1824. I have now neither time nor the necessary collection of authorities, to pursue this subject farther. I send you a newspaper article on the subject, which shows the inconvenience the public submit to, for want of a regular system of weights and measures. The two commercial nations of the world are eminently Great Britain and the United States, and the advantages arising from their adopting one and the same system, would be very great indeed.

I am, dear sir,
Your obedient servant,
THOMAS COOPER, M. D.

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* This seeming neglect or rejection of Dr. Cooper's offer, was far from being designed, as a subsequent letter has explained to him. Any contributions from his pen, that his leisure and convenience may permit to be offered, will always be highly acceptable.—Ed.

From the Columbia Times and Gazette.

BUSHEL AND HALF BUSHEL.

Sir,—Some time ago, I bought in this town a half bushel measure, branded S. B. 1835. It measured eleven inches and a quarter in diameter (inside measure,) and seven inches and three-quarters in depth. It contained therefore 770 cubic inches and one-third. But it *ought* to have contained 1075 cubic inches, and was, therefore, more than one-fourth deficient in size.

To any person acquainted with figures, this is plain. The area of a circle whose diameter is 11¼ inches, is 99.4 inches; which multiplied by 7.75 is 770.35.

By express statutory enactment in all the old thirteen States, New York excepted, the dry measure bushel is to be eighteen inches and a half inside diameter, and eight inches deep; and it shall contain 2150.42 cubic inches: hence, the half bushel must contain by law 1075 cubic inches, whereas the half bushel in use in Columbia, according to my specimen, contains but 770.

I presume the store-keepers buy and sell by the same measure, so that they are out of the question: but it is surely a public grievance which the public authorities ought to rectify, if the inhabitants receive the bulk of 770 instead of 1075. Ought not the intendant and town council to put this to rights? They possess, I believe, a copper bushel, but for what purpose I know not. The matter complained of is surely worth their attention.

I have said that, by the law of England, the only measure for corn and grain was the Winchester bushel of 18½ inches in diameter by eight inches deep, containing 2150 cubic inches. The acts of Parliament enforcing the use of the Winchester bushel, and prohibiting every other measure for corn, are 22 Ch. 2, ch. 8,22 and 23, Ch. 2 ch. 12. In 4 Term Rep. 750 and 5 Term Rep. 353, it is decided that no local usage will justify the selling of grain by any other measure than the Winchester bushel, or its aliquot parts. The colonies adopted the same measure, and the old thirteen states also by express law have done the same. About seven or eight years ago, New York chose to have its own peculiar weights and measures, and altered the old corn bushel, but no other state followed her example.

By Sect. 1. of Act of Assem. of South Carolina, of April 8, 1710, the standard of all measures used in Carolina is to be conformable to the measures of England: and by Sec. 2, any person who shall keep or use any weights or measures than such as are marked by the public officer, shall forfeit ten pounds. The mark is directed to be

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By Act of Assembly of South Carolina, 12 April, 1768, made perpetual by Section 1, of act of Assembly, of 12 March, 1783, it is ordained, that the bushel measure, the half bushel, peck, and half peck, shall be made *according to the standard of London*, that is, the Winchester measure ordained by act of Parliament. Also, that each measure shall be made of cedar wood, neatly shaped, and handled with iron.

The English Parliament in 1825, 5 Geo. 4, ch. 74, altered all the old weights and measures of that kingdom, and established what are called the imperial weights and measures. The old Winchester gallon (our *legal* gallon at this moment for dry measure,) contained 268.8 inches, which multiplied by eight gives 2150.4 for the bushel. The imperial gallon now contains 277.274 cubic inches, and the imperial bushel 2218.192 cubic inches. But no state in the union has adopted the imperial measure, or changed its old Winchester bushel of 2150 cubic inches—New York excepted. By act of Assembly of South Carolina, of 17 of March, 1785, the several justices of the county courts of this state, shall have full power and authority to regulate weights and measures within each of their respective jurisdictions, and shall enforce the observance thereof under such penalties as are provided by law for that purpose. As the Circuit Judges have succeeded to the power and jurisdiction of the County Court Justices, application may be made to the Circuit Court by the town authorities. Or, as every corporation may make a by-law in harmony with and in support of the laws of the land, the Intendant and Town Council, I apprehend, may lawfully enforce the existing acts of assembly, by a by-law prescribing the most convenient means of doing so.

The nearest approximation to the legal contents of the Winchester half bushel, will be a round measure thirteen inches and one sixteenth of an inch inside diameter, and 8 inches deep. This will be within about a cubic inch of 1075.

A BUYER.

From the Petersburg Intelligencer.

HINTS AND QUERIES

Submitted for the consideration of the Merchants of Petersburg, and the Farmers trading to that place.—Published in 1825.

Does the commercial prosperity of a town increase in full proportion to the increase of productiveness of the soil, and the profits of the farmers of its back country?—and is not the country interested in a similar and equal degree, in the prosperity of its market town? Can the one possibly derive profit from its labor, enterprise, or from the bounties of nature, without the other sharing largely in the benefit?

Have these truths been kept in view by us—or have we not (both of town and country) nourished a ridiculous hostility to each other, and opposed our own future profits, for the pleasure of neglecting or thwarting the present interest of our neighbors?

Has not our want of concert and good feeling hitherto prevented our obtaining any portion of the Fund for Internal Improvement? though that fund has drawn an enormous sum from this, for the exclusive benefit of other parts of the state?

Does not our section present valuable and profitable objects for improvements in water carriage—and if we will only look to our own interest, and will unite for its promotion, have we not both the right and the power to divert a due proportion of the improvement fund, for our benefit?

Have not the improvements of the Upper Appomattox been carried on directly contrary to the opinions of the best modern engineers? By "*sluicing*," or removing shallows and obstructions, in a rapid stream, the still and deep waters are drawn off, and other obstructions are uncovered or caused to form: shoals of sand and gravel, if cut through, are again formed by the action of whatever first caused them; and even if the labor is not endless—if the bottom remains regularly graduated thoughout—the certain consequence is, that the unobstructed stream will be more rapid, of course shallower, and perhaps as unfit for navigation, as when in a state of nature. The best and cheapest mode for improving streams like the Upper Appomattox, is by "locks and dams," by which still water of any required depth is obtained. Willis's River has been improved on this plan—and boats can easily navigate that inconsiderable stream, which cannot be carried thence down James River.

The lower parts of the Meherrin, Nottoway and Blackwater, (without including any part of Chowan,) together form good and uninterrupted navigable water for from 100 to 130 miles; and if desirable, it would be easy to remove the obstructions still higher up the Meherrin and Nottoway. Almost no use is made of this extensive means of transportation, because it does not lead to Petersburg, the nearest (and as yet the best) market for that country. Though navigable water continues thence to Norfolk, yet the low prices there, and the circuitous and difficult passage, have caused most of the produce to be brought to Petersburg, by from 40 to 70 miles of land carriage. Like causes have drawn to the same market the products of the Roanoke, contrary to their natural destination: but of that hereafter.

The circumstances which have hitherto made Petersburg the market for the waters of the Chowan cannot long continue, and the trade must take another direction, unless this extensive and now useless water-way is connected by a navigable canal with the Appomattox; and this seems quite practicable, and in proportion to the expense, no other improvement promises more profit to both town and country. The head of Blackwater is within two miles of the Appomattox Canal Basin, and the latter is on a higher level. The present canal, enlarged throughout, and continued through Petersburg to the head of Blackwater, would empty all the water brought down the Chowan: and the canal continued through Blackwater Swamp to where its own water would become navigable, would join, and bring into immediate and profitable use, the upper (and perhaps the lower) waters of the Chowan. It would be equal to adding to the canal upwards of 100 miles more, made almost free of expense.

If this scheme were completed, it would have the following beneficial effects:

1. The rich and very extensive swamp lands of Blackwater might be drained by digging the canal through their lowest part; and property to an immense amount would be formed from what otherwise must continue a worthless nuisance.

2. The expense of transporting produce would be reduced far below land carriage. The expense saved would operate as a high premium for increased cultivation and improvement of the soil.

3. The whole of this increased product would add to the trade of Petersburg, and by that means every part of its back country would be indirectly benefited.

4. Provided the commercial enterprise of Norfolk continues torpid, and *provided the merchants of Petersburg give prices as high as those of Richmond*, the rich produce of the Roanoke would take this as the cheapest course to a good market, and perhaps this may be greatly reduced hereafter, by a cut from Roanoke to Meherrin. But this great object cannot be gained—nor will the present trade of Petersburg be saved—if it does not compete in prices with Richmond.

Cannot commodities be exported from Petersburg as cheaply as from Richmond? And if so, why are not equal prices given, and equal profits made?

The trade of the back country of Petersburg is taking the course to Richmond, higher prices serving to more than compensate the difference between land carriage and the present bad navigation of the Appomattox. Wheat and tobacco are carried from south of the Appomattox, and sometimes through Petersburg, to the Richmond market. It is even apprehended by many, that the new Manchester Turnpike, (which ought to be highly beneficial,) will injure Petersburg, by facilitating this passage: but, if equal prices are not given, it requires no prophet to foresee that Petersburg will be ruined, and every farmer of its back country be (in effect) removed twenty miles further from market, even without the aid of the Manchester Turnpike.

In offering these hints, I have no inducement which ought not equally to operate on every man in this part of the state. I have no concern in commerce, or town property—and if every proposed improvement was completed, they could not increase the product of my land, nor give me a better passage to market. Neither do I profess to be particularly informed on any of the subjects of improvements now proposed. The purpose of these hasty and loose hints will be answered if the thoughts of those interested are directed to this subject—and the exertions of the people and the intelligence of their representatives be engaged heartily in promoting the hitherto neglected interests of the

SOUTH SIDE.

From the Silk Culturist.

PROSPECTS OF SILK CULTURE IN WESTERN VIRGINIA.

By the following letter from one of our correspondents, we are pleased to learn that the culture of silk is progressing in Western Virginia. Though every section of the United States may be truly said to be adapted to the cultivation of the tree and the rearing of the worm; yet we have ever considered the climate of Virginia as being peculiarly so, especially for the propagation and growth of the Morus multicaulis. The native mulberry, also, which is found in great abundance and luxuriance in that region, gives that State, at present, a decided advantage over that part of the country where it is not indigenous. They can commence operations immediately with a full supply of food, while others must delay until they can procure it from cultivated trees. The more we hear of the results of experiments in feeding with the foliage of the native mulberry, the more are we convinced of its value; and we would advise all, having it within their reach, to feed upon it the coming season; and we have no doubt of their producing silk of a good quality, and in quantities which will afford them a large profit.

In recommending this course, however, let us not be understood as advising them to neglect the cultivation of the white mulberry, and especially the Morus multicaulis. The former, should it not be wanted for foliage, is valuable for timber and fuel, and the latter is, in our opinion, decidedly the best variety for the silk worm. In order to insure the complete triumph of the silk enterprise, all species and varieties of the mulberry should be sought out and cultivated, and experience will ultimately teach us their respective values.—Ed. S. C.

Polsleys Mills, Monongalia County, Va.
October 11, 1836.

F. G. Comstock, Esq.

Sir,—In the course of February last, I read many encouraging accounts of the culture and manufacture of silk in the United States; and about the 15th of February last, I received a prospectus of the Silk Culturist, and the next day I obtained five subscribers, (including myself,) and have since ordered four copies more for my neighbors, and are pleased to see many of them taking quite a lively interest in the culture of silk. I sowed one-fourth of a pound of the white Italian mulberry seed last April, and three of my neighbors sowed the same quantity; but owing to the season being dry, our seed did not vegetate very well, as we did not obtain more than from 5 to 7,000 plants from the one-fourth pound of seed each—and there are many others that have sowed several ounces of seed in this place and vicinity. I have contracted for 200 Chinese cuttings for myself, and 550 for my neighbors. I intend to adopt Gideon B. Smith's, Esq. plan in cultivating the Chinese mulberry, as may be seen in the Silk Manual, published by Sinclair & Moore, of Baltimore, the first year, and Mr. Cheney's plan the second year—by laying down in a furrow the roots and branches as described by him in the last number of the Silk Culturist. I intend to transplant my white mulberry trees next spring, or fall, in the hedgerow form, on two acres of land, and in the course of two years time, I am in hopes that I shall be able to stock one acre with Chinese mulberry trees. Next summer I intend to build a cocoonery about 20 by 30 feet, two stories high, and feed a few thousand worms the same season, as an experiment, for information, although I have full faith in the culture of silk. I shall commence in a small way, and extend the business as my foliage will admit of. In the adjoining county, (Harrison,) John and Josiah Wilson, Esqrs. are preparing to engage in the culture of silk. I am informed they have from 10 to 15,000 White Italian mulberry trees from two to four years old, and intend feeding as many worms next summer as their foliage will admit of. They intend cultivating the Chinese mulberry next spring also. Two gentlemen in this vicinity have about 100 Chinese plants on their second years' growth; and one gentleman has three trees on their third years' growth, which have been killed to the ground for the two winters past; but they have grown from the root, this season, to the height of 7½ feet by the 1st of August, when I last saw them. The gentleman says the trees have ripened much better this season, than any season previous. He thinks they may stand the winter, unless it should be *uncommonly* cold. Although our climate is *usually much milder* than the climate of New England, we sometimes have severe cold weather here. I think we have, in few instances, a week or two at a time, as cold weather here as I ever experienced in Massachusetts—being a *native* of *Franklin county*, Massachusetts, and a resident in New England about thirty years ago. I have resided in Virginia about sixteen years, and have had an opportunity of knowing the climate of the two sections of country.

Amos Brooks, Esq. of French Creek, Lewis County, Virginia, has about seventy Chinese trees, on their two or three years' growth, and has been multiplying them as fast as he could by means of layers, and expects to have from 5 to 6,000 cuttings from them for sale this fall. Messrs. Francis Pierpont & Sons, have fed 6,000 worms this season, from which they obtained 37½ pounds of cocoons; and Mrs. Pierpont made several skeins of white sewing silk of an excellent quality; but the remainder of the cocoons she reeled suitable for stockings. The above worms were of the white kind that commenced spinning at about thirty days old; the eggs were obtained at Meadville, Pennsylvania. The worms were, when at their full growth, three inches long. They made most of their cocoons white, but many of them were yellow. John S. Barns, Esq. obtained 1,000 eggs from Hartford, Connecticut, last spring, and they were about six weeks old when they commenced spinning; but did not do very well, as many of them died before they commenced spinning, owing, probably, to its being a very cool, rainy time for about ten or twelve days, commencing about a week before they commenced spinning. What cocoons they made were of a large size. The worms were of the large brown kind.

Henry Morgan, Esq. fed a few thousand worms of the same kind, with about the same success that Esquire Barns *had*, under the *same circumstances*, it being at the same time. All of the above gentlemen fed on the native mulberry, which is very plenty in this section of the country.

Yours respectfully,

E. NEWCOMB, P. M.

Extracts from the Journal of the Franklin Institute.

LIST OF PATENTS ISSUED IN MARCH, 1836, FOR IMPROVEMENTS OF MACHINES, &c. TO BE USED IN AGRICULTURE, OR DOMESTIC ECONOMY.

With remarks, by the Editor of the Journal of the Franklin Institute.

For *Cutting and forming heads of Barrels, &c.;* Hiram Andrews, Canaan, Litchfield county, Connecticut, March 2.

Various machines are in use for cutting heading for casks, &c., but that described in the specification of this patent appears to be sufficiently new to justify a claim to invention. The heading is to be cut rounding by means of a concave, circular saw on a revolving shaft, within which saw there is a circular cutter, of somewhat less diameter than the saw, and in contact with it, furnished with teeth so formed as to give the proper bevel to one side of the head. A similar cutter on another shaft bevels the opposite side of the head, the latter being properly secured on a revolving platform, operating as a chuck. The drawing is very indifferently executed, affording but a general idea of the machinery, and is, therefore, not such as the law requires. The specification affords a good general description, but no more; and the claim is to "the combination of the several parts of the machine, and the placing them in the position which effects the object of cutting and forming heads for any casks of any dimensions." Such a claim we do not think good, as it does not designate any particular combinations, as characteristic of the machine, whilst several of the things combined, have been similarly arranged in other machines, for the same, or other purposes.

For an improvement in the *Axles of Wagons, Carriages, &c.*; Spencer Coleman, Mount Pleasant, Spottsylvania county, Virginia, March 2.

These axles are called rolling axles, and from the description it appears that they are so denominated from the whole axle being allowed to revolve in boxes fixed on the bolster, or other suitable part, of the frame of the carriage; whether the wheels are also to revolve freely on the axles we are not told, but suppose that they are, otherwise there would be a difficulty in turning the carriage. There is not any claim made, and the patentee is in error in supposing, as he must, that the revolution of whole axle is a novelty.

For a *Churn*; Amos Hanson, Windham, Cumberland county, Maine, March 2.

The cream is to be put into a square box with a curved bottom, and to be agitated by means of revolving *ladle boards*, or dashers, which are to be moved by a cog wheel and pinion. The claim is to "the gearing that is attached, and that operate said machine"!!

For an improvement in the *Bar-share Plough*; William P. Cannon, Monroe county, Tennessee, March 4.

Claim.—"What I claim as my invention, and not previously known, in the above described plough, is the mortise, heel plate, and screw, on the horizontal bar, allowing the plough to be regulated in the depth by turning on the heel screw, instead of the eye or ratchet, which rendered the plough stationary as to depth, unless through the alteration of the horses' hames. And in discovering the property, and first making of the mortice in the upright, or perpendicular bar, so as to fix the plough at any depth desirable by the moveable rivet."

For *Cotton Gin Grates*; Edwin Keith, Bridgewater, co. of Plymouth, Massachusetts, March 4.

This patent is taken for making the grates of cotton gins of chilled cast-iron. The method generally preferred, is to form the slots in the grates by laying plates of iron in the flasks when casting, which chills the parts where the saws operate; sometimes, however, the whole face of the grate is to be chilled. The claim is to "the making of grates for cotton gins of cast-iron, or other fusible metal suitable for the purpose, in sheets of two, or more, connected at the end; and of chilling them either in the whole or in part, as described."

What "other fusible metal" is suitable for the purpose, we do not know; these words, it is true, will do no harm, but they are unmeaning, and intended to guard against some airy nothing.

For an improvement in the *Plough*; David Prouty, and John Mears, Boston, Massachusetts, March 4.

The claims made consist, "First, in the inclining the land-side, so as to form an acute angle with the plane of the share. Second, the placing the beam on a line parallel to the land side, within the body of the plough, and its centre nearly in the perpendicular of the centre of resistance. Third, the forming of the top of the standard for brace and draught." These points, it is stated, are not claimed separately, but in combination with each other. This plough, we are informed, has been highly approved by those farmers who have used it.

For a *Smut Machine*; Marcus P. Spafford, Gainsville, Genesee county, New York, March 8.

A conical body is to revolve within a conical case, as in many other smut machines. Both the exterior of the runner, and the interior of the case are to be first covered with sheet-iron, and then with sole leather, and through these coverings iron teeth are to be driven, cut nails answering the purpose. A fan-wheel is employed to blow through between the runner and the case, so as to drive the separated smut, &c., entirely away. A second fan-wheel below the machine is to effect the final cleaning. The patentee says that he "does not claim any part of the above construction other than the combination of the leather and sheet-iron, to retain the teeth, and in separating smut from grain, so as that they shall be immoveable; and also the adaptation of the fan on the top of the cone to produce a current of air downwards through the teeth."

For *Leaching Ashes, and making salts for Pearlash*; Elijah Williams, Erie, Erie county, Pennsylvania, March 8.

The instructions are to boil crude ashes in weak lye, or water, over a brisk fire, for about twenty minutes, the weak lye, or water, and the ashes, being in about equal proportions; this is to be let into the leach during the effervescence. The boiled ashes to be leached about eight inches in depth in the trough, boiling hot weak lye to be first used, and then boiling hot water. The lye is then to be boiled down in the usual manner.

The boiler should be made of sheet-iron, or copper, with a flat bottom, about three feet wide, and eight long, and twenty inches deep. The leaches to be of wood, with a flat bottom, and having a straw strainer, with a tube below for letting off the lye. Lye obtained by this process, and put through a lime strainer, will make good salts for melting. The claim is to "the boiling and leaching ashes, as above, without the use of lime, and making salts suitable for pearlash."

The above is the whole substance of the specification, if substance it have. To us, however, it is altogether obscure and indefinite.

For an improvement in the method of *Making*

Mould Candles; Jefferson Donlap, Village of New Holland, Lancaster county, Pennsylvania, March 8.

This is an apparatus for passing the wicks into the moulds, giving them the proper twist, and drawing the candles simultaneously from the moulds. The machine appears to be well adapted to the purpose, but would require more than a verbal description. The whole arrangement is claimed.

For the *Application of latent heat to Cooking, &c.;* Peter Wenn, an alien, who has declared his intention to become a citizen of the United States. Philadelphia, March 8.

It is a little surprising that a patent should be obtained for a contrivance so manifestly useless in an economical point of view, as it is scarcely to be expected that any number of persons would purchase what few would receive as a gift, on the condition that they should use it. Passing over the false philosophy of boiling, &c. by latent heat, we proceed to state that the apparatus consists of a tin case, into the lower part of which quick lime is to be put, and upon this cold water is to be allowed to run, when, by the slacking of the lime, a sufficient degree of heat is to be disengaged to boil, stew, &c. &c. The claim "is to boil water, to bake, heat, cook, and to dry substances *by means of latent heat,* evolved in the before described apparatus, without the aid of fire, flame, or radiant heat; and the manner in which the apparatus is to be used as aforesaid."

As a mere article of curiosity the thing was well enough, though scarcely fit for a "nine days' wonder." The idea of laying in quick lime enough for fuel, of discharging and vending the slacked lime, with all their concomitants, is one which no person, possessing judgment upon the subject, would entertain for a moment; and we dare aver that the patentee would not continue to use his own apparatus in his family, were the lime sent to him gratis.

For a *Washing Machine;* Albion P. Arnold, Readfield, Kennebec county, Maine, March 12.

A double headed beater is made to vibrate in a trough in just the same way as in many other washing machines; and after giving the exact measures of the individual parts, the patentee claims "the fluted ends of the chest, the covering, the iron shaft and boxes, the steel spring and the lever on which it acts," to which might have been added "the washerwoman," if not previously claimed.

For a *Bed-bug Destroyer;* Brittain Garrard, Maysville, Blount county, Tennessee.

Although three or four patents have been obtained for scalding bugs to death by steam, and although the kind of thing used for the purpose was well known prior to the obtaining of the first patent, it seems that there are yet some which have escaped destruction. The present patentee makes some change in the arrangement of his steam kettle, or boiler, rendering it somewhat more complex, but we do not think more convenient, than heretofore. We shall not describe, as the patentee has not claimed, the alterations, or improvements, made in "the family safety scalding pot and steam engine."

For a *Mantle and Fender for Fire Places;* Elijah Skinner, Sandwich, Stafford county, New Hampshire. First patented April 19th, 1822. Patent surrendered and re-issued March 12.

Neither the original, nor the renewed, specification presents any claim, and the principal, we believe the only, difference between them, is that the description in the latter is less full and clear than that of the former. The mantle is to be of sheet, or of cast-iron, and projects out like a shelf, having a facing descending at right angles from it. The fender is to be a thing of sheet-iron, bent thus |‾; one edge of it going against the back of the chimney, and the other resting on the hearth, so as to cover the fuel and form a close stove. These affairs appear to be independent of each other, and ought, in this case, to have been the subject of two patents; we do not think, however, that the point is worth disputing.

For a *Cooking Stove;* John Liddle, Schoharie, county of Schoharie, New York, March 12.

A furnace is to be surrounded by a rectangular chamber furnished with doors, and intended either for baking, or boiling, having openings in its lower side, over the fire, to receive boilers; when used for baking, these openings are to be closed by a cast-iron slide. Each end of this chamber forms a flat flue, communicating with flues surrounding an oven which surmounts the chamber first named. As we are left to discover the novelties in this contrivance, by the entire omission of a claim, we shall transfer the task to the reader.

For a *Cast-iron Fire Place;* William Burgess, Middleborough, Plymouth county, Massachusetts, March 12.

An open cast-iron fire place is to have two or more ovens, at the back of it. The fire place must project out into the room, as the openings into the oven are at each end. There are also to be openings between, and at the back of the ovens, forming flues around which the heated air may pass. The claim is to "the application of the oven and cooking apparatus, to the common open fire place, or frame, as above described." The contrivance here reclaimed, resembles many others, and is not distinguished from them by any thing presented in the specification.

For a *Cotton Baling Press;* James C. Mitchell, Madison county, Mississippi, March 12.

In this press there are two followers, which, in pressing, are made to approach each other, by two shafts, each having a right handed screw cut on one end, and a left handed screw upon the other. The screws stand vertically, their upper ends revolving in collars in the cap of the press, and having spur wheels upon them above the cap. Their lower ends work in steps in the side of the press. The two followers have nuts let into them adapted to the screws. As this press is intended for baling cotton, there is a portion of each screw shaft, in the middle, which is left square, for nearly the thickness of a bale. A large spur wheel, on a vertical axis, turned by horse, or other power, mashes into the wheels on the upper ends of the screw shafts, the right and left handed screws then cause the followers to approach, or recede, according to the direction in which they are turned.

The dimensions of the respective parts, and the appendages necessary for the packing of cotton, are sufficiently described in the specification. The construction of the press, with the exception of the wheels for working it, is claimed as entirely new.

PROCEEDINGS OF THE AGRICULTURAL SOCIETY OF FREDERICKSBURG.

Communicated for publication in the Farmers' Register.

Annual Meeting, Nov. 11, 1836.

The Society was called to order by the Secretary, when the rule requiring the officers to be elected by ballot was suspended, and the Society proceeded to the election of their officers for the ensuing year: Whereupon the following named gentlemen were unanimously elected:

JAMES M. GARNETT, *President.*
GEORGE HAMILTON, 1st *Vice President.*
FRANCIS W. TALIAFERRO, *2d Vice Pres't.*
R. B. SEMPLE, *Secretary and Treasurer.*

Many persons having petitioned to become members of this Society, they were severally admitted.

Allen W. Morton having, through the Secretary, presented to this Society two volumes—one a "Geological Reconnoissance of the state of Virginia:" the other, "Memoirs of the Agricultural Society of Virginia"—on motion of Major James Richards—

It was Resolved, That the thanks of the Society be tendered to Mr. Morton, through the Secretary.

The Society then adjourned to attend the exhibition, and to meet again at 3 P. M.

Evening Session.

The 1st Vice President in the Chair

The Committee on mares, colts and riding horses, report—That the exhibition of this year is not equal to the last; and furthermore report—That Mrs. Maria Taliaferro is, in their opinion, entitled to the premium for the best brood mare in consequence of the superiority of two fine colts by Truffle, which were exhibited with her—and that Mr. Rothrock exhibited the best colt. Their attention was called to riding horses--two were shown —one by John H. Lee, the other by Charles Tayloe—neither of which is considered as entitled to a premium, but are of opinion that Mr. Lee's horse is the finest. **JAMES RICHARDS**, *Chairman.*

The Committee on bulls award the premium to John H. Lee's young Durham bull, Preston.
ROBERT T. WILLIS, *Chairman.*

The Committee on milch cows award the premium to Thomas Scott's Alderney cow Red Rose.
R. T. WILLIS.

The Committee on beef, sheep and mutton, award to John F. Taliaferro, of Orange, the premium for the best grass-fatted beef—to John Glassell, for the best work ox—to John Gray, of Stafford, for the best mutton—and Wm. Pollock, of Stafford, for the best ram and ewe.
GEORGE ROWE.

The Committee on flour report—That they have examined two lots of flour, one exhibited by Mr. Robert Willis, of Orange, the other by Mr. Wheatly of Culpeper; and think them both of good quality—but award the premium to Mr. Willis; it being the unanimous opinion of the committee, that his was of superior quality.
WM. ROTHROCK, *Chairman.*

The premium was awarded to Robert Wallace, of King George, for the four best contiguous acres of Indian corn, each acre having produced a little less than 60 bushels.

The Committee on stallions and jacks report—That the premium for the best bred stallion be awarded to Mr. Dickinson, of Louisa, for his horse Falconi, by Sir Charles—also a premium to Mr. Marshall, of Culpepper, for his horse Young Macedonian, being a large, strong stallion, and calculated to improve our carriage and saddle stock. **FRANCIS W. TALIAFERRO**, *Chairman.*

On motion, Resolved, that George Hamilton Francis W. Taliaferro, and Wm. J. Rothrock, be appointed to form a scheme of premiums, and report to-morrow.

The Society then adjourned to 9 o'clock to-morrow.

Saturday, Nov. 12th,—2nd Day.

The Society met persuant to adjournment—the President in the chair.

On motion of James Richards,

Resolved, that hereafter all premiums awarded shall be paid in money to the successful competitor, who is under a pledge of honor to lay the same out in plate, with some inscription engraved showing it was obtained from the Agricultural Society of Fredericksburg.

After the adoption of some preliminary measures, the society then adjourned to the court house to attend the Exhibition of Domestic Manufactures, &c., and to hear the President's Annual Address.

Evening Session.

Persuant to appointment, the Society met—the President in the chair.

The Committee on Butter report—that after making an examination of a larger quantity of fine butter than they have ever seen exhibited, do award the premium to Mrs. Jean Morton, for the best lot of fresh butter.
WM. JACKSON, *Chairman.*

The Committee on Domestic Manufactures have awarded the following premiums, viz:

For the best carpet, $5, to Mrs. Thomas Scott, of Orange.

The best counterpane of wool, $3, to Mrs. Lucy Quarles, of Orange.

Second best ditto, $2, to Mrs. John C. Browne.

The 2d best ditto of cotton, $3, to Mrs. Wm. Rothrock.

Second best ditto, $2, to Mrs. William Skinker, of Fauquier.

The best pair of wool stockings, $1, to Miss Julia E. Hill.

The best piece of flannel, $5, to Mrs. L. V. Stevens.

The best piece of negro clothing, $5, to Mrs. L. V. Stevens.

They have also awarded discretionary premiums as follows:

For one piece of matting, $2, to Mrs. Aaron, C. White, of Caroline.

Two embroidered shawls, $2, to Miss Skinker of Fauquier.

One piece of jeans, $2, to Mrs. Cole Dickinson, of Caroline.

One bed quilt, octagon figure, $1, to Miss Berryman, of King George.

One cap of down, $1, to Miss Richards of Culpeper.

A piece of carpeting, $3, to Mrs. Vass, for the Female Orphan Asylum of Fredericksburg.

JOHN SCREW, C. C.

The Committee on Premiums report, That they have made the following changes in the scheme of premiums of the last year, viz:

For the best "*thorough or full bred*" stallion, $20.

For the best stallion without regard to blood, $10.

For the best colt or filly without regard to blood, not exceeding 3 years old the past spring $5.

For the best colt or filly "thorough or full bred," not exceeding 3 years old last spring, $10.

For the best contiguous 10 acres of wheat, to be measured (as heretofore) in the presence *of one person*. not less then 15 bushels to the acre, $10.

For the best ten contiguous acres of Indian Corn, to measure not less than 50 bushels to the acre, and to be measured as heretofore save in the presence of *one disinterested person*, $10.

For the best 2 or 3 year old mule, $5.

On motion, it was Resolved, That the proceedings of this meeting, and the Annual Address of the President, be published in the Arena, Herald, and Farmers' Register. The Society then adjourned.

JAMES M. GARNETT,
President.

ROBERT B. SEMPLE,
Secretary and Treasurer.

ADDRESS TO THE MEMBERS OF THE AGRICULTURAL SOCIETY OF FREDERICKSBURG.

Communicated for publication in the Farmers' Register.

By James M. Garnett, President.

We meet, my friends, to commemorate this, our 19th anniversary, under circumstances peculiarly discouraging to our profession. Almost innumerable enemies, some of which have never assailed us before, have contributed nearly to *unseed* us, (if I may coin a word) as to wheat and rye, whilst our chief staple, Indian Corn, has been so extensively injured to reduce the present crop below the average, in many parts of this and other corn-growing states. The cotton crop too, has been so late in ripening, that much will be injured by frost. I mention not, however, these thing, by way of uttering Jeremiads, for which I never had any fancy, but to urge upon you, most anxiously, the necessity for greatly increased exertion on the part of all who have patriotically resolved never to give up our good old ship, Virginia—*she*, who has weathered so many storms—*she*, who has carried us and our forefathers through so many perils; and who has yet soundness and strength of timber enough to bear all her faithful and gallant sons, gloriously through every present and impending danger—provided only, that they will be *true to the last*.

To doubt this, would be to inflict a deeper pang on my heart than it has ever felt on public account; and, therefore, I will hasten to more cheering views of the prospect before us; a prospect which nothing, I think, can prevent the present generation, especially the younger portion of them, from realizing, but their abuse or misuse of the blessings so amply bestowed on us by an all bounteous Providence.

But before I present these views, permit me, in conformity to a practice commenced last year, to detail briefly the few experiments which I have made since our last meeting. Three were made with corn. The first was to ascertain the difference (if any) in its produce, when planted in land ploughed up late in the fall, or in that prepared just before planting. Six or eight beds only were thus prepared—the others, on each side, for a considerable distance, having been ploughed in November last. The soil was dry and of a medium texture, between light and stiff, with a slight cover of weeds, crab-grass, and some scattering spots of white clover, "few and far between." The culture was the same, in every respect; but no difference whatever has ever been perceptible in the growth or condition of the corn.

The second experiment in the same field and soil, with the same working, as to time, was to ascertain the difference, if any, between corn worked entirely, after coming up, with the cultivator for which you honored me last year with a premium, and that which was cultivated with the plough, the hand-hoeing of each being the same. My eye cannot discover the least difference, although some have said they thought the corn made with the cultivator was best. In regard, however, to the saving of labor by the cultivator, there can be no variation of opinion—for it is certainly in the proportion of two to five and a half, or six. The third experiment was to determine, whether corn planted in high land, as late as the 30th of June, would ripen thoroughly. It was made with a few grains of yellow flint corn, brought by our old friend and secretary, Col. Gray, from Galveston Bay, in Texas, there called Spanish Corn. It was planted among some pumpkins, in land of very inferior quality, but manured in the hill with drawn ashes and plaster of Paris, in the proportion of three pecks of ashes to one of plaster; the quantity in each hill a small spadeful. Most of the silks on this corn were dry on the 86th day from the day of planting; but the hard, and unusually early frosts, prevented its ripening perfectly. From this single trial, made under such circumstances, I could form no conclusive opinion of its productiveness, in comparison with other varieties of corn; but its early maturity might render it valuable in difficult and backward springs. Perhaps, however, some of the varieties already in use among us might ripen quite as early, if planted as late as this was. But my present year's trial, which is the third with the Maryland twin-corn, (improperly so called, unless from 3 to 8 and 9 at a birth, can be called *twins*,) has so thoroughly satisfied me of its superiority, in all the most desirable qualities, to all the kinds heretofore tried in this part of the country, that I do not, at present, expect ever to plant any other;

although I shall not cease, on that account, to continue my comparative experiments with every variety that comes highly recommended by competent judges; for however fantastical and hobbyhorsical some of my agricultural notions may be thought, I confidently hope never to mount *an ear of corn as a hobby*; at least during my presidentship of your society. Deem it not, I beg you, an extravagant supposition; for I myself have seen several redoubtable riders thus mounted, as I could prove, if necessary, by a host of witnesses.

Every year, for many past, has contributed to convince me, that we shall have to rely more and more on the corn crop, as our chief staple, in all the tide water portion of Virginia. The importance therefore, of ascertaining which kind is most valuable, in every respect, is so greatly enhanced, as to require, on the part of every corn-planter, much increased care and attention in prosecuting his efforts to ascertain the fact. In the three years' trials made by myself, I have established beyond a doubt, that there *is a difference* of not less than 15 or 20 per cent, in favor of the twin corn, over two or three of the most popular kinds cultivated in those parts of Virginia with which I am best acquainted; but I would thank any gentleman, (whether hobbyhorsical or not,) if he believes that he has a preferable kind, to send me a few grains, and I will promise him a faithful and a fair trial, so far as I can possibly make it so. Permit me to invite all corn-planters to co-operate in making this trial next year, and so long as our society holds together. The labor and expense will be a trifle not worth estimating, while the gain may exceed all ordinary calculation: for none, I think, can now doubt, that Indian corn must be our chief source of revenue, in all the tide-water portion of Virginia, unless some other crop, yet to be tried, should prove its superiority. But, strange to say, although the fact is well known to most, perhaps to all of us corn planters—the majority seem content to go on, in the same humdrum way pursued by our great-great-grand-fathers—content, as it would seem,) to act as if we had arrived at the "ne plus ultra," of perfection in our particular calling. To address those who have adopted this creed would be quite as great a proof of hallucination in the preachers as in their audience; it would truly be preaching to deaf adders; but I have persuaded myself to believe, that there are a goodly number still among us, who have "*eyes to see, ears to hear, and understanding to comprehend*," all that most conduces to their own, and the general good, and therefore I earnestly repeat the vital invitation, "*hasten to rescue*;" for our dearest interests are in jeopardy.

Another of my experiments was with a variety of Indian pea sent to me by that very zealous and intelligent friend to agriculture and all its interests, Mr. Herbemont, of South Carolina. It is the same kind which he has so highly recommended in the Farmers' Register, 3d vol. page, 93 under the name of the Chickasaw pea; and as far as I can judge by my single trial, well deserves the recommendation there given of it. My peas were planted in hills, about three feet apart each way; from 2 to 4 in a hill, and nearly or quite 3 weeks after our first planting of other varieties. This I found to be too late to escape early frost. The ground was a spot of poor land marled last summer twelve months, for turnips. The pea-vines grew erect to the full height of 4 feet in the best ground, having uncommonly large and succulent stalks and leaves. The first and only gathering from only half a pint of seed produced so large a gathering as to justify the conclusion that they are very productive—for a far greater quantity was left on the vines. These were given to milch cows and hogs, which eat them very greedily. As a green dressing for land they must be far preferable to other varieties, for this is the only kind known to me which does not run, although growing very luxuriantly. This quality renders them best also, as long forage for farming stock, to which use Mr. Herbemont has applied them, and says that his "horses preferred them to all other fodder."

My experiment with the Guinea grass is still contined, although with less sanguine hopes of acclimating it, than I had at first. This is my third year of trial. The last unparallelled winter killed a large portion of the roots; but I collected the hardy survivors, and set them in rows 2 feet apart, near my stable. These have been worked three times with the hand-hoe, and cut five times, at an average height of fully three feet. My conclusion from this 3 years experiment is, that the Guinea grass, if planted where it is convenient to give it a slight covering, before hard frost, with straw or coarse litter, will prove a valuable auxiliary to lucerne, clover and other green food; and therefore is still worthy of cultivation in a country where natural grasses are so scarce as to render artificial ones necessary.

I have now given you the sum and substance of my experiments since we last met; and they are of so little ostensible value, that I should not have detailed them, but to comply with a determination made last year, to set the example of such a practice, in the hope of tempting others to pursue it, who would prove more capable than myself of thereby benefiting our society and the vital cause to which it is devoted. My *failures*, (by the way,) should have been stated, and I will now give them; for a fair detail of an unsuccessful experiment is often as instructive as that of the most fortunate a man can make. The trial of the skinless oat was continued—but produced little more than the seed. This, however, was *not adulterated*, as Mr. Prince has reported of *his*, in the Farmers' Register, but was quite as pure as the quart I purchased of one his agents, at the rate of sixteen dollars a bushel: of course, profit and loss must be charged with this failure. The reputation of the experiment of the drilled-wheat, in regard to which I reported so favorably, at our last meeting, proved to be nearly a total failure, as it fell somewhat short of two for one. Eight other bushels, which I sowed broad-cast, produced about the same meager increase of seed, and that utterly unfit either to grind or to sow. I have therefore bid farewell to wheat, as a staple crop, until some more adventurous farmer shall prove, that it may, once more, be made to advantage, in our part of Virginia.

Let me now endeavor to present those views of the prospect before us Virginian agriculturists, from which I confidently believe, that all true friends of our good old state may rationally conclude that they ought not yet to desert her, as they would a ship stranded upon a desert shore.

There are *yet* means vast in power, if not in variety, to improve our husbandry—increase our agricultural wealth—and strengthen our security against desolating emigration; and nothing more is required to render them effectual for all these vital purposes, but *that* public spirit, untiring industry, activity and perseverence which characterize our northern and eastern brethren. Thousands of these are making fortunes—if not as rapidly as the cotton and sugar planters of the south, yet with all reasonable speed, and moreover, in peace and safety; while the latter are making them at the daily hazard of their lives; hazards inevitably produced by climate, or incidentally, but not the less certainly, by such universal laxity—nay, total inefficiency of legal restraints as most unquestionably renders the three great blesings of free government, life, liberty, and property, far less secure than in any of the old thirteen United States. I say not this from any invidious motive towards our younger sister states; no, God forbid; but simply to urge what I believe to be an undeniable fact as an inducement to prefer an old to a new-settled country; in other words, to live in and die by old Virginia. Without doubt there are thousands of as good moral men in the new states, as in the old; but the truth, I think, cannot be denied, that there is far less power—I will not say inclination—in the former, to restrain and punish the immoral portion of their population; and hence the perpetration of a much greater number of those outrages and crimes that mar the peace and happiness of every community wherein they are committed. The appetite for making money in the new states would be quite as strong in the old, if constantly stimulated and provoked by the same powerful incentives: for man is much the same in his passions every where. But we have less of that demoralizing spirit of speculation, engendered by the inordinate lust for wealth, because there are much fewer subjects and opportunities to gratify it. Our governments being much older, all the different trades, professions and callings, essential to a regularly organized society, have long existed among us, in a numerical ratio duly proportioned, or nearly so, to each other. The necessary consequence of this state of things is, that a systematic, uniform course of business is established for each, which, in a great measure, precludes speculation: labor, food, clothing, and all which constitutes the material for the internal trade and commerce of the country, possess an interchangeable value approaching much nearer to a certainty, and therefore affording far less chance for those inordinate gains so frequently made in new countries, and which form the sole temptation with most persons to seek them. The new settlers there, (with very few exceptions,) soon become, to the citizens of old countries, what the lottery brokers and dealers in that species of gambling are to the regular tradesmen and yeomanry in every country. The first cannot exist content with small, or even moderate profits; but live in a constant state of feverish excitement, and with an omnivorous appetite for gain, whose cravings increase with every new supply of food, however enormous in quantity that may be. This appetite by frequent indulgence, soon becomes a disease—not less destructive, both to moral and physical health, than drunkenness; and he who voluntarily, and with no better motive than to increase wealth already sufficient, places himself in an atmosphere wherein he is daily and hourly exposed to contract it, (as almost every settler in our new states does) can hardly expect to escape, nor does he merit exemption. The worst consequence of this all-absorbing passion is, that, in the universal scramble for dollars and cents which it inevitably produces, public spirit is paralyzed—our benevolent and social feelings are blunted, if not annihilated, our regard for the preservation of order and the inviolability of law is either lost or forgotten, and the moral condition of society grows worse and worse, until it becomes so intolerable as to end in civil commotion and bloodshed. Men know not themselves while living under a government of laws, where justice is regularly administered, and crimes certainly punished. But let them once get beyond these salutary restraints, and many of them soon become as different animals as if they belonged to an entirely different race of beings. To what other causes, but such as I have enumerated, can we ascribe the notorious facts, that in some of our new states, it has not unfrequently happened that citizens, in broad day-light, shoot, and assassinate each other with entire impunity, in their own houses, and in the public streets of their towns and villages; that the civil magistrate, in attempting the execution of his duty, has been mobbed and his life endangered; and that large bodies of men have, on some occasions, constituted themselves the judges, jurors, and executioners of several individuals, either by hanging them without any process of law whatever, or murdering them in a jail to which they had been legally committed? The creed and practice of such men might be given in a few words, and thus catechetically stated.

"Who made you? I don't know. For what purpose where you made? To do what I please, if strong enough, and to make money. What is the use of making it? To make more. What are the means? Any which you believe you can practice successfully. Are health, and life, and reputation worth risking for such a purpose? Aye, verily, and much more, since the command of money enables you to command every thing else in this world, except the three trifles just mentioned."

If it be asked, "why such remarks, in an agricultural address?" The answer is, that one of the most essential means to improve our husbandry will be to stop the emigration of our farmers and planters; and that such statements as I have given, founded upon notorious facts, must have a tendency, at least, to check the desertion of our state.

Another very effective means of improving our husbandry in general, and our agriculture in particular, would be to secure legislative aid for it; and this might certainly be done, if we could only prevail upon our agricultural brethren, one and all, forever to abandon the ruinous practice of making a man's political partyism, the chief, if not the sole test of his fitness to legislate for us. Rely on it, my friends, we never shall obtain any thing from our legislatures, constituted as they now are, and long have been—never indeed, until we send firm, well known, devoted friends of the landed interest to represent us, instead of men whose chief employment it has been, for years, to waste their own time and the public money, in utterly fruitless party quarrels, and vain boastings about their own state, which these quarrels are ruining as fast as if that were their real and sole object. Banish all such men forever from your public councils—no matter to what party they belong, and we should find our agricultural interest cherished and treated as the great prolific germ, the vital food, of every other legitimate interest in the community. This has been, and all history confirms it, a cardinal article in the creed of every great statesman in every civilized country in the world, and their practice has most nobly proved it. In our own country, Virginia stands alone, I believe, in having done nothing—nay worse than nothing, for her agriculture; yet such is the inordinate pride and vanity with which the worthless demagogues have inspired her people, that they are continually exulting in her great national importance, while the husbandry, the chief, the only true source of that importance, may be figuratively said, to be actually bleeding to death for want of a skilful doctor. Look at New York, now decidedly at the head of the union, both in agricultural and commercial prosperity; and to what other cause is this attributable but to her wisdom and patriotism in fostering, by legislative means, these two great sources of national wealth, power and influence? She has not only a State Agricultural Society, encouraged by large appropriations of public money, and diffusing its benefits throughout her territory; but several of her most wealthy citizens, among whom the patriotic Stephen Van Rensellaer stands conspicuous, have contributed large sums towards the improvement of her husbandry. Yet *we Virginians*—citizens of a state, once the first in our confederacy, but now, (with shame, deep and bitter shame, do I say it,) among the last in relative importance, can fold our arms, apparently in perfect apathy, and look on with entire composure, at the rapid progress of other states in every good work; while our legislatures are making themselves laughing-stocks for the rest, by the eternal intermeddling with federal matters, over which they can exercise no control, to the utter neglect of those numerous legitimate means by which they might do much towards regaining, in a great degree, our former standing in the union.

Another effectual step towards improving our agriculture—a step by no means difficult to take—would be to economize our labor by improving our implements of husbandry and modes of culture, to the utmost attainable degree. Much remains to be done in both these particulars, as regards our great staple Indian corn. I can well remember the time, when it was cultivated at nearly four times the expense, that it is now; and scarcely a year passes in which I do not witness some, often great, improvement in the process. It would certainly be still more rapid among our members, if each would make it an invariable rule to report, at every annual fall meeting, any thing new to him, on this subject, which he might deem beneficial. Such a practice, I am sure, would become more common, if we would only divest ourselves of the idea, that, when we begin to make a written communication to our society, we are, in fact, preparing an article for a newspaper, instead of a plain, brief statement of facts for our members, which, although useful to ourselves, would not necessarily be published.

I have reserved for the last, the suggestion of two other modes—the one direct, the other indirect, of improving our husbandry, and rendering it so productive as to convince even the most sceptical that there is no necessity for abandoning our native lands to the wild animals of the forest. The latter plan is, to establish a State Agricultural Society, to be composed of members selected from all the other agricultural societies, to meet annually in Richmond, for the purpose of devising the best ways and means to promote those interests which our own legislators, whose especial business and duty it should be, have so long and so utterly neglected. Concert and co-operation, as a class, is what we most want, and this plan, if any, would secure it. Should our Society approve it, (and the vote will be taken this evening,) it may be published in time to be considered by the Agricultural Convention, which will probably meet in Richmond, either at the time appointed by the last, or at an earlier day. The members of that body may also have time to ascertain the wishes of their constituents on the subject, and come prepared to act accordingly.

The other suggestion, if adopted, will furnish "*another string to our bow*," by adding a new article to our staple-crops—new as a staple, but long and well known as a garden vegetable; but whether to call it long or short "*sass*," I do not know. I mean the *sugar beet*, so successfully cultivated in France that its culture is rapidly spreading over all Europe. It cannot admit even of a doubt that it will succeed quite as well with us as in France, and probably better: for experiments have already been made which prove that the American beet yields more saccharine matter than the French beet, in the proportion of about 10 to 7; and in regard to the quantity that our soil is capable of producing, I will state a well authenticated fact, which, although single, ought to satisfy us that no fears need be entertained on that score. Mr. Lawrence Muse, for many years past a resident of Tappahannock, in Essex, and who was a gentleman of unquestionable veracity, once raised in his garden two beets of the long red kind, which he himself informed me were weighed in the presence of several other gentlemen, and that the largest weighed eighteen pounds four ounces, the smallest seventeen pounds eight ounces. I urged him several times, to publish the account in the newspapers as a match for some of the statements then going the rounds in all of them, during an unusual dearth of party-politics, of marvellous big pumpkins, squashes, ruta-baga, and mangel-wurtzel, raised in the ungenial soil of Yankee Land; but his publication never appeared, although often promised; for my friend, unluckily, was one of that very numerous family called "*Procrastinators*," a family, by the way, which, I fear, has more members in our own dear state, than in any other that can be named. I speak *understandingly*, (as congress-men say,) on this subject, being at least cousin german to some who rank very high among the brotherhood; although I must confess that I do not pride myself much on the relationship. Among planters and farmers this family does quite as much mischief as the Hessian fly, the wheat worm, the chinch-bug and all the other flies, worms, and bugs put together, that war upon their crops; and the man who could devise an effectual cure for their besetting sin, would justly merit the highest civic honors which could be conferred on him. Cure this, and we should no longer "postpone to a more convenient season," (as unbelievers do the consideration of religion,) matters that imperatively require our immediate attention. We should never lose, as now frequently happens, a subordinate and subsidiary, but still important crop, by delaying to secure it at a critical time, merely because, (as we say,) "*it would be working out of turn.*" We should do every thing at the right season, but the particular order in which they were done, would always be varied according to the changes of the weather, and the condition of our arable lands. There would be no interference in our agricultural operations, and of course, all would be performed without loss or misapplication of labor. Thus to act, at all times, is the great art to secure success in all the branches of husbandry; and none who practice it constantly, will ever be under any necessity to abandon their native homes, their friends and their kindred, for strange lands, in pursuit of riches.

In connexion with the subjects heretofore noticed, permit me to say a few words more; to which I invite the attention, not only of our members, but of all my auditors who may not have joined us. There are among you some very favorable symptoms of the spirit of internal improvement. But take care—take *special care*—that, in the exuberance and ebullition of your newly excited zeal, you do not overshoot the mark—you do not burst your boilers—by undertaking to do something or other, which nature has forbid. Take care, my good friends, that, where wealth is certainly to be obtained by managing properly *the surface* of our mother earth, you do not dig too deep into *her bowels* after it, merely because certain parts of this said surface exhibit indications, which many take for positive proofs, that there are beds of gold, copper, or other precious metals, some two, three, four, or five hundred feet below, which will soon make all the diggers after them as rich as Crœsus—that is, *if* such beds be certainly found; and also, *if* their veins (as they are called) be certainly very extensive, and *if* they will yield an abundance of ore that is very rich.

In striking contrast with the foregoing *ifs*, suffer me to add one, in regard to which, I think, there cannot be even a shadow of doubt. *If* you will improve your certain advantages, advantages which the dullest man may see and comprehend, such as the navigation of your river—your great water-power for manufactures—your public roads leading directly to this town—roads whose condition, at some seasons, would disgrace a community even of Hottentots; then as surely as the sun rises and sets, Fredericksburg, and the whole country connected with her, will rapidly increase in wealth and commercial importance, until she becomes one of the first towns in the state: for Nature, herself, has placed the means in sight of every one who will open his eyes to see them. So much by way of advice—a thing so frequently offered—so rarely accepted. But being confident that you will not mistake my motive, and that you will ascribe what I have said to the deep and sincere interest I feel in your welfare, I will make no apology, since I am sure it can do no harm and hope that it possibly may effect some good.

In conclusion, permit me to make one more suggestion, and this I address particularly to the ladies and gentlemen of this town and its vicinity. *It is*, that they will immediately form a Horticultural Society here. The advantages and benefits derivable from such associations, is no longer a matter of doubt or vague speculation. Wherever established, either in other countries or our own, they have certainly led, not only to vast improvement in the quality and quantity of supplies for the table, but to many important discoveries in regard to the multiplication and perfection of old and new varieties of garden fruits and vegetables, as well as to the introduction of many practices in the tillage and manuring of land, which are highly beneficial to the general interests of agriculture. Horticultural Societies, therefore, have nearly as high claims to the encouragement of all the true friends of husbandry, as agricultural societies themselves have. One of the strongest of these claims is founded on the fact, that we should have the ladies as our most efficient associates; the ladies, who are always friends to every thing which can meliorate and improve society. Horticulture is an employment in which they take a delight, almost instinctive, an employment for which a very great portion of them manifest a natural taste, and in which therefore, they are peculiarly fitted to excel. In truth, the virtuous and intelligent portion of their sex are to the moral world what flowers and fruits are to the natural—they beautify, adorn and embellish it, with its most attractive charms. Their aid is essential to the prosperity of all our pursuits; their co-operation to the success of every domestic concern; they call forth all the best affections of our nature, by encouraging us in every good word and work; while the greatest blessings of life cannot be half enjoyed without their participation.

From the Genesee Farmer.

APPLES FOR FATTENING HOGS

Although the attention of our readers has been before called to this subject, we believe its importance is too little appreciated generally; and as the present is the season for action, we shall lay a few facts before them, showing the advantages of employing apples as food for fattening hogs, over other substances. We shall first endeavor to show that they are a valuable kind of food, and secondly, that they are a cheap one.

First, with regard to their value. A correspondent of the Maine Farmer in 1834 made the following experiment. He commenced feeding his hogs on apples in August. A pig four months old and weighing 95 pounds, was fed 18 days as follows:—first, two bushels of sour apples, boiled with six quarts of oats and pea meal, weighing four and a half pounds, were given him. At the end of six days he had gained six pounds.—He was then kept six days on the same quantity of boiled sweet apples and meal, at the end of which time he had gained six pounds more. He was next fed on an equal quantity of boiled potatoes and meal, and at the end of six days he had gained only five pounds. Here the superiority of both sweet and sour apples over potatoes was decisively shown.

A correspondent of this paper at Lockport, in a communication last winter, states that he shut up seven hogs about fourteen months old on the first of October; they were in poor condition, and estimated to weigh about 150 lbs. each, and worth in the market 12 1-2 cents per pound. They were fed fifty days on apples, mostly sour, boiled with a small quantity of water, with the addition of a bushel of bran and a pint of salt, to three bushels of apples. At the end of fifty days they were fed with twelve and a half bushels of soft corn in the ear, and afterwards slaughtered. The average weight of each was 272 pounds. Estimating the apples at 25 cents a bushel, the bran at 6 cents, and corn at 62 1-2 cents, the whole expense was $77.55, and the pork at $6.12 1-2 per cwt. $116, leaving a clear profit of $41.45. See whole experiment detailed, in Genesee Farmer, current volume, p. 61.

These experiments it will be observed, were with *cooked* apples. The practice has also suceeded when they have been fed in a raw state; though the latter is not as profitable, except on a very small scale, when the trouble and expense of cooking would be comparatively greater. In the following experiments, the apples were given uncooked. A correspondent in Onondaga county turned thirty hogs and from thirty to forty shoats and pigs in an orchard of 400 trees about the 15th of September, and they remained there until the latter part of November when they were slaughtered, with the exception of twelve dollars worth sold alive, and about a dozen retained as store pigs. They yielded about 5,450 lbs. of first rate pork, fattened on apples wholly, without any grain. This was the fourth experiment of the kind made by the writer, all of which were attended with complete success.

In the 5th volume, page 324, of the Genesee Farmer, S. P. Rhoades of Skaneateles says, "a friend from Massachusetts informs me that he shut up a hog by himself, and fed him entirely on apples and water, last fall, and that he became very fat, was well filled, and the pork was hard and sweet as that fed on corn," He also states that when turned into an orchard where there are both sweet and sour apples, hogs will eat about as much of one as of the other.

In the Brattleborough Messenger, a correspondent says, "A man in Guilford, conversing on this subject, said to me, 'There is a hog that will weigh over two hundred; I brought him home in July on my back. I have given it nothing but apples, and a little slop for drink."

Secondly, with regard to the cheapness of this kind of food. This may perhaps be best determined by calculation. We will suppose that an orchard is planted on an acre of ground, and that the trees stand at a distance of twenty five feet asunder, which would not be too near when they are merely intended for this purpose. This would give about seventy trees to the acre. The trees at twenty five cents each would cost $18.75; and the expense of planting, supposing each tree to cost ten cents each, would be 7 dollars. While the trees are small, the land may be tilled and will produce as much as before; and from the time they begin to bear, they may be considered as paying for the ground they occupy, by their fruit. Such an orchard, therefore, in a good bearing state, would cost as follows:

One acre of land	$50 00
Seventy trees,	18 75
Planting,	7 00
	$75 75

The anual interest on this sum at seven per cent. would be $5.30, which would be the actual expense of each crop, as the pasture of the ground would pay for gathering. If each tree bears on an average five bushels a year, (this is low estimate if the most productive varieties are selected,) the annual crop would be three hundred and fifty bushels, which according to the preceeding calculation would be at the rate of one cent and a half a bushel. Estimating the cost at double this, the clear profit in the second experiment before stated, instead of being $41,45, would actually be $74,45.

One of our neighbors, last year, made forty dollars from a small orchard of about an acre, by fattening hogs, and reserved a large supply for winter and other use.

If instead of feeding potatoes to their hogs, farmers would sell their potatoes, and purchase apples for this purpose, they would find it to their advantage. In ordinary seasons, apples suitable for feeding may be had at one quarter the price of potatoes, or even less, and their superior value has been already shown. It would be far preferable, however, if they would raise their own apples, of kinds expressly for this purpose.

Extracts from Travels of a Philosopher.

CHINESE AGRICULTURE.

I arrive at Canton, where new objects of admiration arise; the noise, the motion, the crowd augment, the water, as well as land, being every where covered with multitudes. Astonished at the amazing appearance, I inquire into the numbers of the inhabitants of this city and suburbs; and after comparing different accounts, find that they must amount at least to eight hundred thousand souls. My surprise, however, is greatly increased, when I learn, that to the northward of Canton, about five leagues up the river, is a village named *Vachan*, which contains a million of inhabitants; and that every part of this great empire, extending about six hundred leagues from north to south, and as much from east to west, is peopled in the same proportion.

By what art can the earth produce subsistence for such numbers? Do the Chinese possess any secret art of multiplying the grain and provisions necessary for the nourishment of mankind? To solve my doubts, I traversed the fields, I introduced myself among the laborers, who are in general easy, polite and affable, with some share of learning, and knowledge of the world. I examine, and pursue them through all their operations; and observe that their secret consists simply in manuring their fields judiciously, ploughing them to a considerable depth, sowing them in the proper season, turning to advantage every inch of ground which can produce the most inconsiderable crop, and preferring to every species of culture that of grain, as by far the most important.

This system of culture, the last article excepted, appears to be the same that is recommended in all our best authors, ancient and modern, who have wrote on this subject; our common laborers are acquainted with it; but how much must our European farmers be surprised, when they are informed that the Chinese have no meadows, natural or artificial, and have not the least conception of fallowing, never allowing their lands the slightest repose.

The Chinese laborer would consider meadows, of every denomination, as lands in a state of nature: they sow their lands all with grain, and give the preference to such grounds as we generally lay out in meadows, which, lying low and being properly situated with respect to water, are consequently by far the most fertile. They affirm that a field sown with grain, will yield as much straw for the nourishment of cattle, as it would have produced of hay, besides the additional advantage of grain for the sustenance of man, of which they can spare too, in plentiful seasons, a small portion for the animal creation.

Such is the system adhered to from one extremity of the empire to the other, and confirmed by the experience of four thousand years, amongst a people, of all the nations of the world, the most attentive to their interest. That which must render this plan of agriculture the more inconceivable to Europeans, is the idea of their never allowing their lands to lie one season unlabored. Those who for some years have endeavored, with such public spirited zeal, to re-animate amongst us this neglected art, have considered as the first and most important object, the multiplication of artificial meadows, to supply the defect of natural ones, for the fattening of cattle; without once venturing to think of suppressing the mode of fallowing the grounds, however far they carried their system of increasing the number of artificial pastures.

This system, which appears the most plausible of any they have projected, and is received with the greatest partiality by our farmers, is, nevertheless, contradicted by the experience of the greatest and the most ancient land-laboring nation in the world, who regard the practice of meadows, and fallowing grounds, as an abuse, destructive of plenty and population, which are the only important objects of agriculture.

A Chinese laborer could not but smile, if you informed him that the earth has occasion for repose at a certain fixed period of time; he certainly would say, that we deviated greatly from the point in view, could he read our treatises, ancient and modern—our marvellous speculations on agriculture. What would he say, if he saw our lands, part of them fallow, part of them employed in useless cultures, and the remainder wretchedly labored. What would he say, what must be his feelings, if, in travelling over our fields, he observed the extreme misery and barbarism of their wretched cultivators?

The Chinese lands, in general, are not superior to ours; you see there, as with us, some excellent grounds, others middling, the rest bad; some soils strong, others light; lands where clay, and lands where sand, gravel, and flints every where predominate.

All these grounds, even in the northern provinces, yield annually two crops, and in those towards the south, often five in two years, without one single fallow season, during the many thousands of years that they have been converted to the purposes of agriculture.

The Chinese use the same manures as we do, in order to restore to their grounds those salts and juices, which an unintermitting production is perpetually consuming. They are acquainted with marl; they employ also common salt, lime, ashes, and all sorts of animal dung, but above all, that which we throw into the rivers; they make great use of urine, which is carefully preserved in every house, and sold to advantage. In a word, every thing produced by the earth is re-conveyed to it with the greatest care, into whatever shape the operations of nature or art may have transformed it.

When their manures are at any time scarce, they supply the deficiency, by turning up the ground with the spade, to a great depth, which brings up to the surface of the field a new soil, enriched with the juices of that which descends in its room.

Without meadows, the Chinese maintain a number of horses, buffaloes, and other animals of every species necessary for labor, for sustenance and for manure. These animals are fed, some with straw, some with roots, beans, and grain of every kind. It is true they have fewer horses, and horned cattle, in proportion, than we have, yet it is not necessary they should have more.

The whole country is cut into canals, dug by the industry of the inhabitants, extending from river to river, which divide and water this vast empire, like a garden. Travelling, transporting of goods, almost every species of carriage, is performed on these canals, with great ease and small expense; they do not even use horses to drag their boats; every thing is done by the sail or the oar, which they manage with singular dexterity, even in going up the rivers. Where any kind of labor can be performed at a moderate price by men, it is a maxim with them never to employ animals. In consequence of this the banks of their canals are cultivated almost to the water's edge, they lose not an inch of ground: their public roads resemble our foot paths; their canals, however, are infinitely more useful than highways; they convey fertility every where, and furnish the people great part of their subsistence in fish. There is no comparison between the weight which can be transported in a boat, and that which can be conveyed in any kind of land carriage; no proportion between the expense.

The Chinese are still less acquainted with the use, or rather the luxury of chariots, and equipages of every kind, which crowd the principal cities of Europe. The horses necessary for these, assembled in thousands in our capitals, consume the produce of numberless acres of our best grounds, which, if cultivated with grain, would afford subsistence for multitudes, who are dying of hunger. The Chinese wish rather to maintain men than horses.

The emperor and chief magistrates are carried through the cities by men, with safety and with dignity; their march is sedate and majestic, it threatens not with danger those who walk on foot; they travel in a kind of galleys, safer, more commodious, equally magnificent and less expensive than our land equipages.

I have before observed that the Chinese lose not an inch of ground. They are very far, therefore, from allotting immense parks, of the finest ground, for the maintainance alone of deer, in contempt of the human race. The emperors, even those of the Tartar line, have never hitherto dreamed of forming these parks, still less the grandees, that is, the magistrates and the learned: such an idea could never find place in the mind of a Chinese. Even their country houses, and boxes of pleasure, present nothing to the eye all around, but useful cultures agreeably diversified. That which constitutes their principal beauty, is their delightful situation, judiciously improved; where, in the disposition of the various parts which constitute the whole, there every where reigns a happy imitation of that beautiful order of nature, from whence art has borrowed all her charms.

The most rocky hills, which, in France and other parts of Europe, they turn into vineyards, or totally neglect, are there compelled, by dint of industry, to produce grain. The Chinese are indeed acquainted with the vine, which here and there they plant in arbors; but they consider it as a luxury, and the wine it produces as an unnecessary superfluity. They would imagine it a sin against humanity, to endeavor to procure, by cultivation, an agreeable liquor, whilst, from the want of that grain which the vineyard might have produced, some individual, perhaps, might be in danger of perishing of hunger.

The steepest mountains, even, are rendered accessible. At Canton, and from one extremity of the empire to the other, you observe mountains cut into terraces, representing at a distance immense pyramids, divided into different stages, which seem to rear their heads to heaven. Every one of these terraces yields annually a crop of some kind of grain, even of rice; and you cannot withhold your admiration, when you behold the water of the river, the canal, or the fountain, which glides by the foot of the mountain, raised from terrace to terrace, even to the summit, by means of a simple portable machine, which two men with ease transport and put in motion.

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The Chinese nation is capable of the most stupendous works; in point of labor, I never observed their equals in the world. Every day in the year is a working day, except the first, destined for paying and receiving visits; and the last, which is consecrated to the ceremonial duties they pay to their ancestors. An idle man would be treated with the most sovereign contempt, and regarded as a paralytic member—a load to the body of which he made a part; the government would in no manner permit it. How opposite from the ideas of other Asiatics, where none are admitted to any degree of estimation but those who, from their situation in life, have nothing to do! An ancient emperor of China, in a public instruction, exhorting the people to labor, observed that if in one corner of the empire there was one man who did nothing, there must in some other quarter, be another who suffers on that account, deprived of the necessaries of life. This wise maxim is fixed in the breast of every Chinese; and, with this people, so open to reason, he who pronounces a wise maxim, pronounces a law.

From the Genesee Farmer.

CURING CORN.

Farmers the present year have had a fine opportunity of testing the respective merits of the two modes of saving corn by topping, or cutting up by the bottom, respecting which some diversity still appears to exist among those who are the most interested. The frost of the fifth of September was widely and severely felt; and while some adopted the old method of topping, others resorted to cutting up by the ground, and when dried, setting up in small stacks. Either course was undoubtedly preferable to letting the corn stand with the dead tops adhering; but we think experience will convince all who are careful observers, that cutting at the ground, is greatly to be preferred by the farmer who wishes to make as much as possible of his frost-bitten field of corn. We knew of two pieces of corn, owned by the same individuals, planted nearly at the same time, and both equally promising, when their progress was stopped by the frost of the fifth. One of the pieces was immediately topped, and the other was, as soon as possible, cut up by the bottom and stacked. They were both husked a short time since, and the owners assured us, that contrary to the expectation of many who witnessed the different modes of curing, they should get at least one-third more sound corn from that cut up, than from that which was topped and left on the hill.

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Communicated for publication in the Farmers' Register.

AN ADDRESS DELIVERED BEFORE THE AGRICULTURAL SOCIETY OF ROCKBRIDGE, AT THEIR ANNUAL MEETING AT FANCY HILL, OCTOBER 13th, 1836.

By Alfred Leyburn, M. D.

Fellow Citizens and Farmers of Rockbridge:

To-day I feel myself called to the discharge of a duty not a little embarrassing, and the more so to me, because I address many of riper years than myself, and whose experimental knowledge of farming far exceeds mine. The office, however, which I now surrender into your hands, was not of my seeking. With a full knowledge of circumstances, it was your pleasure, on your last anniversary, to elect me your President. As such I now address you. And what shall I say on an occasion like this, an occasion of itself well calculated to generate kindly feeling, and enkindle generous emulation? Shall I begin with the woodman in the forest, and follow him from the clearing of his land to the seeding thereof, through his various crops, and attempt to discuss the different methods of cultivating the same, the time for reaping, gathering or curing, as the case may be—in a word, through the various branches into which the art of farming ramifies? No, gentlemen, time, and much more the presence here of veteran farmers, admonish me to abstain from an undertaking at once so tedious and difficult.

Permit me then, during the few moments I occupy, to call your attention to one principal point, to wit: the use of clover as the sheet anchor of the farmer, and as forming the basis generally of whatever beautiful and comfortable he may have have reared for himself.

Scepticism has had its place in all ages, in moral as well as in physical sciences, in history, politics, medicine, and theology; therefore whatever evidence there may be to sustain a position, and however full and clear that evidence may be as to the correctness of it; nay, I may say that however self-evident a truth may be, there will nevertheless be unbelief in the minds of some, and an attempt to controvert. It is still however, not a little surprising to hear the clovering of lands denounced by some as a useless, and worse than useless expense—and moreover, a crop of St. John's weed, or a crop of narrow leafed plantain, considered not less desirable than one of clover. For the honor of Rockbridge, however, this sentiment, I have no reason to believe, belongs to her; nor do I believe that such a sentiment can ever find a lodgment any where, to be nursed into more than an ephemeral existence.

Having before me to-day, many who are experimentally acquainted with clover and its benefits, they are doubtless ready to respond to the truth of the adage, as old as true, that the best proof of the pudding is in the eating; and many both present and absent, will sustain me in the assertion, that it is every man's interest, in this region of country, to clover for the sake of his land and its immediate benefit to his crops, as well as on account of the many and great collateral advantages derived from such a system. Clover seed, it is true, is an expensive article, but is, to some extent, within the reach of every man. Seldom is any important revolution of any sort, effected except by some effort and expense, and never was a change so important to the farming interests of a country, as that produced by clovering, effected at a less expense. Every man can buy some seed—if he cannot get much, he can get a little, and with that little, work his way gradually into more. As he sows, so shall he reap, and after one proper sowing, and an occasional visit from his hand-maid plaster, taking care that we do not subject it to the too free operation of teeth and hoofs, the different parts of a farm will have soon swallowed seed enough to perpetuate the clover, provided that a system of farming judicious in other respects, be pursued. With such a system we shall, by and by, have turned under clover and enriched our land so that we may, with propriety, pasture some, whilst the land is still in a state of progressive improvement. The great misfortune is however, that few can resist the powerful temptation to pasture prematurely, a luxuriant clover field. Having undertaken to improve thin land by clovering, and well aware that the earth cries out for a full share of the growth to be returned to her by ploughing in, we would fain yield to a request so reasonable, thus modifying and improving our soil. We resolve with all manliness not to yield to the temptation to eat it down, but will plough it down. Our resolution holds out well for a few weeks, when lo! on coming out in the morning, we see in the corner of yonder fence, a breathing skeleton of a cow, scarcely able to maintain her legs, while her scanty yield of milk is extracted from her—and, on going a little farther, our ears are saluted with the wailings and lamentations of some half famished hogs whose every look and motion bespeaks our kind attention. Our feelings of humanity are thus taxed, and that to a degree more than we can well bear, so that our good previous resolution softly gives place to the more benevolent feelings of the heart. The cows and hogs are mustered, and in due form the attack is made upon the clover field, the stock of horses bringing up the rear, and thus ends the clover system. Not having pursued it long enough to derive its many benefits, it is let go and we relapse into our former state. No more common error exists, than that of pasturing prematurely, and the plan most likely to relieve us from this difficulty, is in my opinion, to reduce our stock to a number barely sufficient for present purposes, and remove the division fences. We may pasture still, it is true, but it will not then be clover alone that is pastured. When, however, the farmer's face is set like a flint for the improvement of his land, in rotation clovering and plastering his fields, leaving them undisturbed by his stock, things soon assume a new and fresh aspect. Those gullied hills so long clad in their habiliments of mourning, and valleys where desolation had so long reigned, are now clad in verdant green, and wear the aspect of joy and gladness—thorns and briers having given place to "grass with reeds and rushes." The stock of cows no longer resemble Pharoah's lean kine, but are fat and fruitful, and the milk-maid bends her cautious footsteps homeward laden with her delicious treasure. Now the faithful horse, when released from his toils, regales himself upon the sweet and tender clover, and is nerved afresh for his accustomed task, asking nothing more of his master in winter, when not at work, than clover hay. Now the wailings of the poor neglected hog are no longer heard, but he finds in the florid clover heads a remedy for all his cares, and hastens on to that rotundity which fits him for the knife.

To my mind, it is perfectly clear that it is the interest of every man, in a region of country like this, to adopt a system of clovering for the benefit of his land, and of his more prominent crops; and it is certainly equally clear, that with this system generally in practice, the country will, with entire ease, raise its own pork. Here, indeed, lies one of the most striking benefits of clovering, and one to which the experience of the last year or two in the pork market, should steadfastly direct our attention. The attention once directed to it, and the experiment fully made, my word for it, there will be no looking back, or sighing for former habits. In the spring season the hogs enter the clover field and there remain until after harvest, at which time they are introduced, in good order, to the stubbles, fattening fast upon the shattered grain, and, when done with this, return again for a short season, to the clover. The hogs for the slaughter, being already in good order, have a speedy transition from the clover field to the pen, and a comparative easy one, as regards the owner's corn crib, from the pen to the hands of the butcher. The stock hogs, after having used up the shattered grain, and whatever mast may be in our enclosure, (the frost having now closed the clover season,) are assembled in or near the farm yard, and thus entering the winter in good order, will be carried through it with very little expense, provided the stock of hogs be judiciously selected. I have reason to believe, moreover, that for hogs closely penned, clover hay cut somewhat green and salted, will of itself be sufficient to sustain them pretty well through the winter.

There are those present to day, who have tasted and tried the various streams of comfort flowing out of this system, and where is the man who after having fairly tried it, is ready to give it up? As soon almost would the right hand of that man "forget its cunning" as that he should abandon a system which makes his barns to overflow, his horses, cows and hogs, to multiply and be fat, and the whole face of nature to smile around him.

Permit an humble individual, therefore, to urge those who have not already done so, to at once adopt this system, so delightful as well as profitable; and endeavor by the use of clover, with plaster and manure, to make their lands progressively better. producing from "thirty to sixty and even a hundred fold."

For some years past, the wheat crop, on which we principally depend for profit, has suffered greatly from two causes, viz: the Hessian fly, and hard freezing. As a means of resistance to the fly, I believe that nothing can be relied upon but strength of soil, and that but imperfectly. Here then should be a powerful additional incentive to clover, and to the use of all means at all likely to give vigor to the soil, and thus fortify, to some extent at least, against the ravages of this fell destroyer and stealthy robber. It can, however, afford no sort of protection against the evils of hard freezing: to this case "human wit and reason are inadequate. To him, and to him alone, "who holds the winds in his hands" are we to look for relief.

Your calling, gentlemen, is pleasant, honest, honorable, and when properly pursued, profitable. Let me then, in conclusion, beseech each one of you to use every exertion to make it still more pleasant, honorable and profitable, by giving to it an enlightened attention—by a free, frequent and generous interchange of opinions—by zealously advocating, and carefully cherishing such publications and institutions as are likely thus to renovate and make happy our beloved country.

From the Silk Culturist.

GREAT INCREASE, AND VALUE, OF CHINESE MULBERRY.

Fredericksburg, Virginia, October 10, 1836.

F. G. Comstock, Esq.

Dear Sir,—In your September number, you have "hit the nail on the head" in your editorial on the acclimation of the Morus multicaulis, from the testimony of the Secretary of the Horticultural Society of Antwerp. The method to which I refer is cutting down the tree, every year, in the fall, to within a few inches of the ground. I have had experience on that point, this year, though my object was not to acclimate the tree. We have none, or but little winter to contend with here. Whilst on this subject, I will detail all my experience with the multicaulis—for you know that if I lived in Maine, I would not give you a fig for all the white and other mulberry trees, for the purpose of feeding silk worm, in Christendom.

In April, 1835, I purchased of an agent of the Messrs. Prince, 75 trees of the morus multicaulis, which I set out, about two feet apart each way, in a moist loamy soil. They averaged about two feet in height, and half inch in diameter at the butt. By this fall they had put up, on an average, six branches about five feet high. In the spring of '36, as soon as I could find a bud swollen, I cut all the branches down to within six inches of the ground. These I cut up into pieces about eight inches long, having two buds on each cutting—amounting in all to upwards of five thousand cuttings. These were stuck in prepared ground to one half their length—one bud in the earth, and one bud out—and I am sure I have not lost five per cent. of them, and many of these cuttings are now six feet tall, and an inch in diameter at the butt.

But the 75 stocks which were cut to the ground have attained the average height of eight feet, and a dozen branches somewhat lower, and are bending beneath the heaviest growth of foliage I ever saw. I had, the other day, a few moments conversation with a gentleman just returned from Europe, and he informed me that it is the practice of the farmers in the mulberry countries, through which he travelled, to cut the trees down annually, not for the purpose of acclimating, (which I have no doubt will serve a good purpose in New England for that object,) but for the purpose of producing a *tender* and *abundant* foliage.

To sum up, the reader will notice the facility with which the multicaulis can be propagated. From 75—5,000 in 18 months—one fourth acre of land—$12.50 first cost, and $5 worth of labor bestowed in cultivation. I am fully persuaded that the multicaulis is decidedly the best tree for feeding the silk worm; and that 8 or 10 by 2 or 3 feet, is the most convenient distance, and that the trees should be cut down every year to within a few inches of the ground.

Respectfully,

J. B. GRAY.

Notes by the Editor.—1. We hope our friends in Maine, will not be deterred from prosecuting the culture of silk by the remark of Mr. Gray. It must be remembered that he is a Virginian, enjoying a climate peculiarly mild, and an air remarkably congenial to the growth and labor of the silk worm. It is also probable that he has no personal knowledge of the climate of Maine, and, like all others who have not visited that state, supposes it to be a region as cold and dreary as Lapland or Iceland. From personal observation, we are convinced that the growth of silk may be pursued to advantage in most parts of the state; and the results of late experiments have also settled the question beyond a doubt, that both the mulberry and the worm will live and thrive in the 45th parallel of latitude. The silk is also of a better quality than that grown in warmer climates.

2. The ratio in which Mr. G. has multiplied his trees is truly astonishing, and the profits he must have derived from them is equally so. He has given the time he has been engaged in the business, the stock with which he commenced, the cost of trees, labor, &c. and the number he has now on hand;—to which we will add their present value, that the reader may have the whole subject before him. Trees of the size and height he describes are worth fifty cents a piece in market, and would be purchased in New England at that price as soon as offered. The present worth of his 5,000 trees is therefore $2500—an enormous sum to be derived from an investment of $17.50 in trees and labor in the short term of eighteen months. These, it will also be noticed, have been produced on *one fourth of an acre of land.* We leave the reader to compute the number, and their value, which an acre would produce in the same proportion.—Ed. S. C.

From the (British) Quarterly Journal of Agriculture.

ON THE EXCRETION FROM THE ROOTS OF PLANTS.

By Mr. Towers.

It may appear superfluous to recur to the subject of secretion and exudation from the roots of plants; but as numbers seem to doubt, and observation and experiment are regarded as little better than theoretic hallucinations, I feel it right to enter the lists once more. M. De Candolle founded his hypothesis upon philosophical deduction; M. Macaire experimented and tested chemically; I reasoned from observation, and still believe I was the first who, in our own country, placed the theory before the public grounded upon the evidence of comparative observations. I, in 1829, knew nothing of the hypothesis of Geneva, and had met with no observations upon the phenomena; but I listened to the remarks of practical men, of gardeners, cottagers, and intelligent domestic cultivators. I observed for myself, and, without looking into the laboratory, or applying any non-natural test or re-agent, arrived at and stated those opinions which I published in the "Gardener's Manual." So much I may be permitted to say, in answer to those objections which have been made in reference to the operations of the laboratory. Prospectively, I shall observe once for all, that, much as I prize experimental chemistry, I witness and read of so many factitious results, when subjects *endued with a vital principle* are acted upon by chemical powers, that I have desisted, and mean to desist, from any attempts to derive irrefragable evidence from chemical tests, and now base my opinions solely upon the facts resulting from observations of vegetable phenomena.

That excretions really are made, there appears to be no rational ground to doubt: no one, I think, can go through a course of gardening operations, without becoming assured that the soil in the field, the garden, and in pots, containing plants, becomes replete, sometimes to saturation, with specific products. I may mention one fact which has just occurred. I observed that the roots of a young plant of *Tropæolum atropurpureum*, Lord Auckland's dark-colored nasturtium, had protruded from the hole in the bottom of the pot. The size of this pot is what we here style a 48; it measures about four inches internal diameter. On striking out the ball, I was astonished to perceive the extremely powerful odor which was emitted. The roots had completely worked themselves around the pot, the fibres were matted, but the whole mass was pungent, as if a quantity of water-cresses had been bruised and applied to the nose. In potting, a great variety indeed of peculiar odors are discernible. *Heliotropes* yield a powerful and almost animal scent; all the *Justicias* a stale and fœtid vegetable effluvia; coffee, one of rather a leguminous character; but that of the *Tropæolum* was peculiarly pungent. I could enumerate a great many potted plants which yield very distinct odors from the ball of roots, that are quite undiscernible till the plants are removed from the pots; but I desist, as the experiments may be tried by every one.

I wish, in this place, to meet an objection which may be started against the evidence of odors adduced above; it is this. We admit, many may say, that soils about the roots of plants, whether they be confined to pots, or free in the open plots of the garden, emit peculiar odors; but do not these arise *from the roots themselves*, and not from matters exuded by them, and dispersed among the particles of the soil? I am prepared to grant that the roots, as well as the flowers of a vegetable, may possess specific aromas, but these cannot be diffused unless they be first emitted; the fact of diffusion, and that to an extent which renders them perceptible at the distance of many inches, or even feet, is demonstrative of the hypothesis of exudation—that which is disseminated must be first given forth: this admits of neither hesitation nor doubt.

If, then, the ground be embued with odorous matter transmitted by the porous system of the roots; or if it be admitted, that the odors arise from the very substance itself of millions of fibres, broken off, and retained by the soil, which cannot by any art be separated from it, the argument is still one and the same; for it is a matter of pure indifference (provided the ground become saturated with any specific substance) whether that substance be gaseous or solid, whether it have been transmitted from the plant, or produced by admixture with broken and lacerated portions of the vegetable body itself. Not to weary the reader with arguments upon a subject which must be self-evident, I shall close my present remarks by observing, that I build my hypothesis much more upon the phenomena of vegetable life and growth, that is, upon natural facts, than upon the results of chemical experiments; and I shall shortly adduce a very closely pursued experiment of a compound nature, in order to establish the fact, that *chemical agency ought* not to be *employed* with *substances endowed with the vital principle*, and that the inferences deduced from experiments upon living vegetables placed in unnatural situations are frequently founded in, and lead to error. Dead matter, mineral substances, and the like, are the proper subjects for chemical analysis; upon them its power can be legitimately brought to bear. The living being is embued with powers peculiar to itself; it is subjected to laws that govern its mode of existence; all its phenomena are indeed dependent upon a specific vital energy: hence we cannot with safety attempt to arrive at definite conclusions from the operation of agents which interfere with and destroy that energy. M. Macaire's experiments are conclusive as far as they go; his ingenuity, and the zeal with which he followed up its dictates, are highly to be applauded; but the experiments which I above alluded to, will, I doubt not, afford proof, that *nature must be investigated in her own way*, and that he who assails, instead of consulting her, will of necessity become embarrassed by perplexing and contradictory results.

That which led me, in the summer of 1834, to undertake my very protracted experiment, was the assertion frequently met with, that the *sap-vessels of plants had been, and might be again, made manifest by the agency of chemical tests.* I had long doubted the correctness of this assertion, and therefore determined to bring the matter to immediate issue. Conceiving that the *balsam (Balsamina hortensis)* presented the readiest means to effect my purpose, because of its rapid growth, juiciness, and great transparency of stem, I selected three cuttings from a plant of nearly the same size;

they were about three inches long; being placed in a bottle of water, and in the stove, they all emitted roots in a very few days. When these had grown an inch or two long, I raised each plant without injuring a fibre, and planted them in three small pots containing the simplest loam I could find: I mean, by this term, a loam free from any foreign manuring substance. The plants were potted at the same time, watered with clear water, and set in the stove to revive; in fact, they never drooped, but quickly establishing their roots in the loam, began to grow. Intermediately, two solutions were prepared, one of *sulphate of iron*, brought to the state of *peroxide* by the addition of a few drops of nitrous acid; the strength of this liquor was so considerable, that the tongue could not conveniently support its astringency; one-fourth of a fluid drachm, a saturated liquor of the peroxide, being added to four ounces of rain water. The second solution consisted of a drachm of powdered Brazil-wood, digested in four ounces of boiling rain water, strained when cold, and tinged an intense crimson purple by the addition of a few drops of pure *(i. e. caustic)* potassa liquor.

The three plants were then treated in the following manner—One was marked "water," the second "color," and the third "iron." To the first, pure rain water only was applied, to the second, the extract of Brazil-wood, and to the third, the solution of iron.

The experiment commenced at the end of July, and was continued till the 17th of August. The plants were always moistened in the way pointed out, with the simple exception, that, once or twice, when a powerful heat had quite dried the soil of the two balsams artificially treated, a little pure water was given to restore its proper texture. The reader is requested to notice particularly the results now to be stated. The first, marked "water," was healthy, and had grown to the height of a foot; had it been in rich soil, and even in a pot of moderate size, it would have been much larger, but the three were retained in the smallest sixties, that is, in vehicles scarcely two inches wide at the top.

No. 2, with solution of Brazil-wood, was not quite so vigorous, but it was nearly as tall and healthy as No. 1. No. 3 was also healthy, but not so tall, and it contracted a slight curve in the stem. The soil of No. 2, became almost as black as ink; that of No. 3, had all the appearance of mere rust.

Now, if the roots of plants while in a natural state, living and growing in soils, really absorb chemical or vegetable fluids, it ought to follow, that the solution of Brazil-wood, having entered the sap-vessels, would yield a dye of black on the application of a solution of green sulphate of iron. To ascertain the fact, I placed a minute drop of the Brazil liquid on a piece of white paper, and applied to it a little drop of the solution of iron, and the formation of ink instantly proved the delicacy and correctness of the test. I then cut a slice from the stem of the balsam (No. 2,) and, having a microscope at hand, examined it, and the stem in every way and direction. I called in a witness, one whose eyes were acute in all botanical investigations; no trace of coloring matter could be discovered, and the iron test produced no effect or discoloration whatsoever. Hence it may be asserted, that the living roots of a balsam, with a white stem, had not taken up the thousandth part of a fluid drop of the coloring matter of Brazil-wood. No. 3, was then investigated, and the detached portions examined in every way, yet no trace of yellow was perceivable. If water, diluted with even one hundredth part of a solution of peroxide of iron, be tested with prussiate of potassa *(hydrocyanate of potassa,)* a blue shade more or less intense will be the inevitable result. This test was rigidly applied, and not a tint of blue, in vessel, cell, or fibre, could be discerned. Hence it was fair to conclude also, that the living balsam, *in mould*, could not take up the slightest quantity of iron. To make assurance still more sure, two other balsams were tested, one—a rooted plant—was taken from the water without injuring its roots, and placed in a solution of peroxide of iron of the strength described; it was killed almost instantly, and fell withered over the side of the glass vessel. The other was an unrooted cutting. I placed it in a decoction of Brazil-wood, and, so far from striking roots therein (as it would have done freely in water,) it became sickly, and died in a day or two.

I draw two important inferences from these experiments: the *first* is, that plants naturally situated, have, by the agency of their vital principle—be that what it may—a power to select and absorb appropriate food; but that the ground may be so saturated with vicious or unnutritious matters, as to prevent the secretion of a due supply of aliment. *Second*, that the true sap-vessels act only while the plant remains undisturbed, and in its natural bed. Persons accustomed to vegetable dissection, have flattered themselves, and indeed asserted, that the vessels may be detected by placing cuttings in colored infusions. Some have also said (and this is a tacit admission of a weighty fact,) that if *rooted* plants be placed in such infusions, &c. they will *absorb, provided the roots be first cut through* near their points. It appears to me certain, that all investigations conducted with mutilated subjects, such as cuttings, slips, wounded roots, and the like, tend to mislead the judgment, and to falsify the inquiry. I do not venture to assert that there are no *exceptions;* but I hesitate not to say that plants in health, living and growing in soil, will not absorb artificial, innutritive substances; they elaborate and secrete; and the soil is to them an appropriate medium, an adjunct of great consequence, through the texture and composition of which they are enabled to carry on the processes which are essential to their being and support. All mutilations are just so many sophistications, and the inferences deduced from the phenomena they afford, tend to error and false philosophy.

That it may not be thought I have introduced a recital which applies to an inquiry into the arrangement and *offices of the sap-vessels*, rather than to one on *radical excretion*, I must add, that the experiments, though directly bearing upon the question of the conducting vessels of plants, leads us to a just appreciation of the value of chemical experiments, when performed upon living beings. We perceive plainly that plants, if growing in soil, have a power to reject substances that become utterly destructive when they are applied to the naked and unprotected roots; hence we ought to be very cautious before we receive, with implicit faith, those hypotheses which may be founded upon phenomena produced by chemical agents upon plants artificially situated. I respect the motives of M. Macaire, and highly value his experimental labors, which at one time, appeared to me, to be so comprehensive, that I partly determined to undertake a series of a similar nature. However, when I witnessed the results of my own investigations, and reasoned upon the diametrically opposite effects produced by the same agents when applied under varying circumstances, I resolved to rely upon the observation of natural phenomena in my endeavor to substantiate the theory of the excretory powers of plants. If, *when in soil*, they absorb nutritive matter, and reject poisonous substances; and, on the other hand, if, when taken from the soil or from water, with their roots in perfect health and security, they die at once, or dwindle away, *when immersed in those very fluids* which are *innocuous* to them as long as their roots are surrounded by earth; then, I think it perfectly fair and rational to conclude, that *no certain unerring deductions can be drawn in respect to the quantity or quality of the radical excretions*, from observations or experiments made upon plants, *the naked roots of which are immersed either in water or in chemical fluids.* Beans, wheat, pease, and other vegetables, have germinated in water, and matters have been emitted by their roots, which afforded certain given results, on the application of chemical tests and re-agents; but I would inquire, can any one venture to suppose that the plants thus grown, were in a truly natural situation? were they excited as they would have been in soil? were they similarly acted upon by the great natural agents, *light, air, water?* Surely not! The grand medium of elaboration—that which connects the fluid of the plant with those in the ground which sustain and nourish it—was absent; in a word, *earth and soil were wanting;* and as without these, not one vegetable being in a thousand, can increase and attain maturity (although many will strike roots in simple water,) it is unphilosophical to conclude, that the vital functions of any plant can be perfectly carried on in media which disqualify it from attaining its full growth, and entire development of parts. Let us pursue inquiries; let us add fact to fact, and also adduce analogical reasons from observed phenomena; but, at the same time, let us be exceedingly cautious how we apply or draw conclusions from the application of an agency which is opposed to nature, and subverts the natural functions of a living subject exposed to its influence.

Upon mature reflection, then, I cannot conceive that the vegetable secretions, which are phenomena dependent solely upon the vital principle and natural stimuli, will ever be discovered or made manifest by the agency of chemical tests and experiments. That these secretions, however, are effected by the radical processes of vegetables, can scarcely admit of a rational doubt. As a chemist, I may be thought to lose sight of, and prove false to, my early profession; but I make no appeal to chemistry, otherwise, than as it enables me to experiment upon tractable substances, and thus to deduce legitimate inferences. I love it as a science, but must repeat my conviction, that we can derive very inefficient aid from the laboratory, when we wish to scrutinize the energy of life; all therein is wrapped up in mystery, which the mind and art of man can neither approach nor unravel.

If, however, we look at a bed of maiden loam, test it *chemically*, and then plant it with successive vegetable crops, we shall perceive a gradual change in the color of the soil. *This is one main fact.* The assured experience of the benefit derived from a *change of crop*, affords another; and the advantage of a certain order of rotation yields us *a third.* To these facts we may add, the particular aroma that the earth receives; for, though there may be exceptions and many shades of difference, yet we cannot fail to recollect proofs of the emission of certain odorous matters highly characteristic of the vegetable with which the ground has been cropped. To these natural phenomena we must have recourse; and in so doing, if we collect all the evidences which are in the power of any active mind to observe, we shall, I believe, find strong analogies in proof, not only of the theory in question, but of another grand philosophical fact, namely, that *vegetable beings never exhaust a soil*, that the densest sward of grass adds vigour and power to the earth of the meadow, and that weeds—poor despised weeds—unsightly as they appear, are not only harbingers of plenty, and prove the goodness of the soil they so speedily and unaccountably cover, but add riches to it, and a fund of nutriment for other and more refined crops. Let us turn our eyes to the scarcely half-weeded garden of the cottager, and compare the enormous crops of bulky cabbages, healthy sound potatoes, onions, &c. with the comparatively poor and dwindled produce of a more wealthy neighbor, whose garden is seldom permitted to be disgraced by the presence of an unsightly weed. Let me not, however, be misunderstood. I am an advocate for cleanliness, industry, and order; and I know that native weeds may overpower a crop, and deprive it of solar, electrical, and ærial influences; but do not let us be so unphilosophical as to suppose that these sturdy natives *impoverish.* All we have to do is to watch their progress in the garden and the field, and never to suffer them to become masters. It is the duty of the farmer and the gardener to hail the presence of weeds as an evidence of a fertilizing principle, and then, by watchfulness and industry, to convert them to manure. But I shall not enlarge on this subject now.

REPORT OF THE ENGINEER OF THE EASTERN SHORE RAIL ROAD.

Washington City, November 10, 1836.

To the Commissioners appointed to survey the route of the Eastern Shore Rail Road:

Gentlemen,—Of the various surveys which have been made under your direction for the purpose of ascertaining the best route for a rail road on the Eastern Shore of Maryland, conformably to the several acts and resolutions of December session, 1835, the one which I have selected as the basis of the preliminary estimates, begins at the Wilmington and Susquehanna Rail Road, near the town of Elkton, and continuing throughout its whole course within the state, crosses the Chesapeake and Delaware Canal a few hundred yards west of the pivot bridge, and after passing a little to the west of the head of Bohemia and Sassafras Rivers, thence by the head of Chester or Millington, and the head of Choptank or Greensborough, and by the North West Branch, eastward of the Bloomery, to the Nanticoke River, which it crosses between Sharp-town and the Delaware line. From the Nanticoke, it follows a very direct course to Princess Anne, whence it diverges south-westwardly to the mouth of Little Annemesic River, on Tangier Sound, its terminus. Its total length is 118¼ miles.

The purpose of this communication limits me very cursorily to remark, in relation to the character of the line, that for lowness of grade and directness of communication, I know of no road of its length by any means comparable to it. The grades rarely reach, and never exceed twenty-one feet to the mile, and this only, on very few miles of its length in Cecil County, and at the crossing of the principal water courses. On much the greater part of the route, the grades do not attain one half that rate per mile.

Between the points of passage of the rivers above named, the lines were intended to be traced perfectly straight, and so far as this was practicable in an experimental survey, it has been done. They are very oblique to each other, and the curves by which they are to be connected, need in no case be of less radius than one mile, and for nearly one hundred miles of the route, very probably of not less than five miles radius.

The annexed estimate is founded, on the facts collected during the experimental survey, and although it was not supposed that this would follow the best ground, the stations were nevertheless taken at 300 feet apart, where the surface of the country was nearly level, and at 200 feet or less, where it became undulating or broken—this is mentioned to show that the quantities stated in the estimate, are not assumed without careful inquiry. The other elements of the estimate are as follows, viz. the road-bed to be formed for a single track, except at the embankments, where it is to receive a breadth of 20 feet at the crossing of the principal creeks and rivers. The viaducts to be of the best timber, and to have a breadth of 20 feet of flooring. The rails to be of 2¼ by ⅝ inch iron, resting on wooden string pieces, 6 by 6 inches, and 10 by 12 inch sleepers, all of the very best quality. The cost of materials and workmanship generally are assumed at the highest current prices, and wherever in framing the estimate of road-bed and bridges there was a doubt as to quantity or value, the sum taken was a maximum, and the price of the iron is that for which it is offered by a most respectable house. I am warranted, therefore, I think, in assuring the Commissioners, that the amount of the estimate need not be exceeded in the construction of the road.

Ample provision it is believed is also made for the transportation upon the road, and for connecting it with the great stream of southern travel, which seeking its way to the north will find this in connection with the ports of Norfolk and Portsmouth, and with the rivers of the south-western part of the Chesapeake Bay, a safe and convenient as well as a very *expeditious*, and at all times too, an *uninterrupted* channel of communication.

In the present state of our statistical information we are unable to present other than general views of the business which may be expected to come upon the road. It is, however, mainly to the transportation of passengers, that this, as well as all other railways, not directly in connection with great mineral regions, are to look for profitable returns upon the capital invested, and it is to this source the friends of the road may with the most undoubting confidence turn themselves.

From the southern seaboard, the country bordering on the Gulf of Mexico, the lower Mississippi and its tributaries, and from all the country which lies south and south-west of the states of Virginia and Kentucky, the number of travellers who annually seek the north in pursuit of business, of health, or of recreation, and who again return back upon the south, is absolutely incalculable; along the navigable water courses, they are seen to crowd the numerous steam boats, and on the seaboard, the packet vessels are fully occupied. During the boating season, the travelling from the south and south-west is almost altogether by steam boats, notwithstanding the acknowledged danger and delays incident to this mode of journeying, west of the mountains. When this season is past, the traveller has no other course, whether he proceeds to the north or returns southwardly, than to take the ports of the Gulf, or to cross the mountains, and journey by the valley of the Tennessee, and thence home. The latter course is often preferred, and the number of travellers, and the quantity of goods also by that route, often greatly exceeds the means of conveyance. Nearer the seaboard, the condition of the traveller upon the road is not more enviable, and the voyage by the coast is beset with some danger, and much discomfort. Conscious of this condition of things, the intelligent men of the south and west are using every effort to awaken and direct enterprise. From the Gulf of Mexico, roads are in contemplation, or are already undertaken, the prolongation of which, must be through the principal towns of the interior of the states of Georgia and the Carolinas towards the western termination of the Portsmouth and Roanoke Rail Road. With these projects are and will be connected, others to lead to the commercial capitals of those states, and from the Mississippi, others will proceed by the way of Georgia, by the valley of the Tennessee, or more directly by Knoxville, and all them uniting with the great line of communication which I have just mentioned, all of them directing themselves towards the Roanoke. By the valley of the Roanoke also, and of one of its tributaries, a rail road which has recently been surveyed, will be conveyed to the same point, the agricultural and mineral wealth of an extensive region, and will return to it the merchandise which it will consume.

It is ascertained that the travel last year between Charleston and Savannah, and the northern cities alone, amounted to between 50 and 60,000 passengers. The contemplation of this great number is alone sufficient to convey to us some idea of the multitudes who throng to the north, from the vast regions of the south and west, the greater part of whom, undoubtedly, would prefer to travel by rail roads, and who, as I have shown, would be conducted by them directly towards your road. Whether, on arriving at the Roanoke River, the choice being before them of the route by Richmond and Potomac Creek, by Norfolk and the Chesapeake Bay, to the Frenchtown Rail Road, or of your road by the bay and peninsula, is a question, which the friends of the Eastern Shore Rail Road will willingly leave to the decision of the traveller. That the general preference would be given to the conveyance by rail roads over that by sea, or by the Mississippi and Ohio rivers during the boating season, or to the mountain roads at any season, cannot admit of doubt.

I have not yet arranged the data by which may be shown the great advantage which the road offers for the rapid transmission of intelligence, and its consequent connection with the transportation of the mail. What I have already said, while speaking of the experimental survey and of the grades, is, however, sufficient to enable the Commissioners to perceive the necessary connection which it must have with this source of revenue.

Situated as the south-western terminus of the line is, in a climate comparatively mild, the navigation of the waters near it, are rarely closed, and never certainly so much obstructed by ice as to present serious difficulty in keeping it free to vessels arriving on our coast, especially from the south, and destined for a port inaccessible by reason of the inclemency of the season, Tangier sound and the neighboring waters, always easy of access and safe, offer sufficient harbors and anchorages in near connection with the road, and capable of being brought in direct contact with it. The advantage, therefore, which it presents of an occasional winter-harbor for merchant vessels, and the facilities which the road presents for the conveyance of their cargoes to their proper destination, are, I conceive, of no inconsiderable importance, viewed either in relation to the interests of the Eastern Shore, or to those of the commercial cities of Baltimore, Philadelphia and Wilmington.

I have already, gentlemen, exceeded the limits which I had assigned to this letter, and must, very reluctantly, pass over a branch of the subject not less interesting, nor less fruitful of mutual advantages than those I have already spoken of; I mean the benefit which this improvement is likely to receive from, and to confer upon the country through which it is proposed to carry it—its connection with the agricultural improvement, and the general amelioration of the condition of the peninsula. These and other topics must be reserved as subjects to be considered in a general report hereafter to be furnished.

The plans and profiles of the ground, and of the several parts of the work, and the details of the estimates, are already prepared in the rough form, and will be in readiness to accompany my report, on which also some considerable progress has been made, should it be in my power, as it has been certainly my desire to complete it. Of this, however, I have no expectation, as I am under orders which separate me from this duty, the moment my health is sufficiently re-established to permit me to travel. The general report which may be somewhat voluminous, and will embrace much detail, will necessarily occupy some time in its preparation; but it can be ready quite soon enough for any purpose for which the Commissioners may have occasion to use it.

It has been my intention also to give plans and estimates for the eastern line as far as it has been surveyed, and of the route which, on separating from the one on which the annexed abstract of estimate is founded, at or near the right bank of Sassafras River, would cross Back Creek at Chesapeake City, and pursue thence the most favorable ground, would cross Big Elk River, at or immediately west of Elkton.

The survey of the ground over which the Branch Road, south of Princess Anne, leading to the Virginia line, with the intention of uniting hereafter with the Virginia Road to Cherry-Stone, has been completed so far as the compass work applied to it. We are, therefore, enabled to assume the length of the branch, and this, together with the striking resemblance which much of it bears to the ground over which the levelling was carried for the location of the main stem near Princess Anne, enables me to give an approximate estimate for this branch, and which will be sent to the commissioners whenever they may desire it.

The lateral roads contemplated to be surveyed under the resolution of your Legislature, No. 108, it has as yet been impracticable to survey, but their location, I presume, will be made at as early a period as possible.

I have the honor to be,
Very respectfully,
Gentlemen, your obedient servant,
JAMES KEARNEY.

Abstract of an estimate of the cost of the main stem of the Eastern Shore Rail Road, of 118¼ *miles long, and of the cost of a steam boat line from its south-western termination, near Tangier Sound,* 85 *miles to Portsmouth, in Virginia.*

For the road,	Dolls.	Cts.
For 1,129,076 cubic yards, excavation and embankment,	263,892	27
For clearing and grubbing,	11,397	00
For bridges and culverts,	120,928	00
For sleepers, string pieces, wedges and iron for superstructure, and for crossings and sidings,	302,034	50
For depots, water stations, wharves and fencing,	70,000	00
For purchase and condemnation of land,	21,500	00
	$945,773	77
Contingencies at 12 per cent.	109,754	85
Total cost of the road and its appurtenances,	1,024,378	62
For locomotive engines, and for passengers' and burden cars,	81,000	00
For two steam boats,	150,000	00
Total estimate,	1,255,378	62

November 10, 1836.

FARMING ON THE RIVANNA. CORN CULTURE—CLOVER—MANURING.

To the Editor of the Farmers' Register.

November, 23d, 1836.

Admonished twelve months ago, as well by a sense of duty, as by repeated calls on the subscribers to your valuable journal, for practical communications—I then devoted part of a rainy day to giving to it a modicum of my experience. But unwilling to obtrude my opinions on the public eye, sharp-sighted as it had become from light recently shed on your paper by a discussion among some of our most distinguished agriculturists, I declined offering my meager essay at so inauspicious a period. *Another rainy day*, however, and the annual business of arranging papers, force it on my notice, and I fear you will have cause to regret that there are not still combatants on the arena, from whose observation I might willingly hide my diminished head. And yet, having made agriculture my profession from the outset of a business life of more than twenty years, I feel more unwilling to acknowledge ignorance than to expose, as I may do, the imperfections of a practice, which has not been without its success. Not entering on the wide field of the vexed question of *rotation*, further than it must necessarily be involved in the tendency of my remarks, I shall content myself with defending *that* which I have practiced for 15 years--avoiding any attack on other systems; and thus, Mr. Editor, I hope to escape the ungloved handling to which a different course might subject me.

Although standing under the shadow of a name which would give but little weight to the manuscript that has so long laid on the shelf, I still feel a repugnance at the egotism of entering so minutely and personally into details that may afford little, or *no* benefit to your readers—and therefore, as *some apology*, (though at additional expense to your columns and *their* patience) have ushered it in with this exordium.

It is not unimportant to mention that four fifths of the arable lands of the farm which is the subject of this communication, consist of what is denominated, above the falls of James River, first and second lowgrounds, which being level or gently undulating, with generally a deep soil, admit of the advantageous use of four-horse ploughs--not admissible on rolling, or shallow lands. This farm was put under a three-field course in the autumn of 1832. Field No. 1. being then sown in wheat was laid down in clover, for *the first time*, in January following. Nos. 2 and 3 taking their rounds in corn, &c. wheat and clover, it will be seen that No. 1, comes under cultivation for the crop of 1835. The clover having been very fine, without a hoof, and scarcely a scythe put into it, the land was in a condition to give its best return.

As in the preparation for, and cultivation of the corn crop, it involves many of the details of the three-field system, and from its intrinsic value and the labor usually expended on its culture, constitutes as important an item in Virginia husbandry as any other--I will submit my plan of managing it through all its stages.

The above field, (No. 1.) was laid into beds of 14 feet width, by four-horse Loudoun bar-shares, carrying furrows from 8 to 12 inches deep, (according to depth of soils,) and 17 wide. The corn, and tobacco lands being selected, as well for their fertility as level surface, on account of the liability of broken lands to *wash* in hoe-crops, were first ploughed. This being done before the new year, they were put in the finest tilth by the agency of frost, assisted by the opening effect of a clover ley and deep ploughing, with its necessary adjunct, cross-draining, by *deep-grips*.

As soon in March as it is *perfectly* dry, the corn-field is harrowed diagonally across the beds with heavy wheat-drags. At the time of planting, when the earth is warm and buds begin to spring, (regardless of dates,) the same drags are passed three times lengthwise the bed—three rows being laid off on each, with a single mould-board plough, carrying a clear furrow from 2 to 3 inches deep. The seed corn having been steeped in liquor from the farm-pen, one night, and rolled in plaster the following morning, is dropped by hand, from 4 to 6 grains in a place, (as I am opposed to re-planting,) at the distance of eighteen inches. It is then covered with an implement—being a frame with two coulters placed side by side—the frame so closed as to bring the coulters *just* within the laying off furrows. This raises a slight list over the grain which prevents the taking effect of the hasty rains, and acts as a cultivation. Hoes follow after, brushing off the clods that may be left on the list and covering exposed grains. When the corn is about six inches high, single horse mould-board ploughs are introduced—commencing their operation in the middle of the balk with the bar next the corn, flushing the whole and finishing as near as they can be gotten to the row. A coulter follows in this finishing furrow, with the foot of it so turned under, as to move every plant in passing. Then come the hoes trimming down this narrow ridge, and thinning to one stalk, except where there are missing hills, in which case, leaving two or more stalks to make up the deficiency. I also leave two stalks in every alternate or third hill, in extra rich parts of the field. As soon as the stalk will bear a heavy earthing with the same ploughs, the balk is thrown back. On account of leaving the field in the dryest state for wheat sowing, I give the water-furrow rows 5 feet distance—*laying by* the three last furrows with a two-horse mould-board plough. This operation finishes the working of the field. My reasoning on which practice is, that a heavy clover ley being made by four-horse ploughs, beyond the reach of disturbance from the smaller ploughs, or the deleterious influence of the sun, affords a rich moist pasture for the roots of this greedy and thirsty plant, which I have observed, will maintain its color in *almost any* drought, on this system.

I would not recommend beds of 14 feet width on *wet* lands—nor do I think them as suitable for corn *alone*, as narrower beds with two rows, as the middle row has the advantage of the others, and will *keep it* throughout its growth. But for wheat and clover, I give that width the decided preference. In ploughing such beds for wheat, after corn, they cannot be reversed with fewer than four horses, without leaving them too low in the middle. I therefore *raise* them with two, by first throwing out the corn stubble of the inside row, with a wide furrow, then filling it by running *wide* on each side; this gives to the beds a handsome arch, without leaving them too high.

To return to the corn crop, however, I housed from fifty nine acres of the low ground division of the first field, (which is inferior to a large proportion of the second low grounds of the same,) 740 barrels of sound and large ears—the average yield being reduced, by the balance of that division having been taken off for tobacco, which requires the richest land. The advantage to the crop of corn from further working than is here stated, would, I think, be trifling; yet on account of the succeeding wheat crop, I would give about harvest, or immediately after, a *very shallow* brushing over with cultivators or hoes. But having under my system *full* crops of corn, tobacco, and oats, besides timothy meadows, all pressing at that season, it would certainly be injurious to bestow more labor on *that one*. In commendation of a clover ley with deep ploughing and efficient draining, as a preparation for corn, let me say that my predecessor told me after the above mentioned result was ascertained, that the same field, when I became possessed of it three years before, would not have yielded more than five barrels per acre. He too is a manager of high reputation; but had not enjoyed (having been an agent) the advantages of clover and its indispensable adjunct, *plaster*. These, with the exception of a thin top-dressing of *stained* straw on, perhaps, two acres of land in the same field (which had been abraded by freshets,) when it was in wheat, constituted the only manuring of the field. Although this teeming production cannot justly be charged, in the *first* rounds, to the three-field course, it certainly speaks loudly in favor of the rotation of corn after clover, particularly, when the succeeding wheat crop (of this year) was better than has been generally obtained this season. As to the result of a fair experiment of the system, I can only say, "*nous verrons;*" but must be permitted to add, that the *same* practiced for 11 years on James River, on a farm less *kind* in proportion to fertility, exhibited a regular improvement.

Before taking leave of this branch of my subject, I must insist on the importance to a great product, of a close and regular distribution of the corn stalks—one only in a place—to prove which, I will give the result of *one* of the many experiments I have made. A frost occurred in *this county* in the spring of 1834, which cut down the corn below the surface of the earth, and appeared to have totally destroyed it. Field No. 3, was in that crop, 80 acres of which had been nicely weeded out with hoes and ploughs. I caused 3 intermediate rows to be laid off and planted in rare-ripe, making 6 on a bed of 14 feet width. A genial shower having occurred in the course of a week, the six rows came out together most beautifully. The first planting of course had the preference: but of the rare-ripe, five rows were left in the richest, *convenient* part of the field. One corner, containing 4,000 square yards, lying in such shape as to be measured with accuracy, (the corn no better than the balance similarly planted) yielded 14 barrels of fine ears.

You, Mr. Editor, as well as your readers, are doubtless heartily tired of No. 1., but in justice to the three-field system, I must be allowed to dispose of the remainder of it. The tobacco and corn land being done with, that portion of the field requiring cleansing of pests, is put in oats: the fairest crop of clover—that is, that which is most clear of pests, which is generally on the hills in each field—is reserved for fallow in August and September. Thus, as regards the clover fallow, mine is a modified three-field course. The whole field having been sown in wheat this fall, will be laid down in clover and other grasses, according to quality of soil and other circumstances, from the first of January to the middle of April, always applying plaster where the young clover assumes three leaves—which depends on the season. I will here remark, that I have succeeded best with clover sown in January. The open condition of the earth, from the effect of frost, takes the seed in deep enough not to be operated on by a sudden thaw which might cause them to vegetate on the surface, thus exposed to frost, and that still greater enemy to clover, drought: whereas, when buried more deeply, the seed vegetate at a later and more regular season, and are protected against being thrown out by the former, or killed by the latter enemy. With all spear grasses, (under which I class those in most common use with us, that is, timothy, herds, and orchard grass.) I have found most success, (*after* the months of August or middle of September,) when sown from the 15th March, to the same date in April, because of the peculiar liability of these to be thrown out by frost, and therefore, their requiring good roots to resist it.

When the farm-pens are broken up in March, the whole of the manure from *them*, as well as that which has been made in the stables since the winter top-dressing on wheat, is hauled out and ploughed in on tobacco, corn, and oat lands, which being in clover, require light and partial manuring. After that period, all that can be made by littering stock of every description liberally, is reserved for top-dressing at the time of sowing wheat, if there is leisure, (which I rarely have,) and during the frozen spells of winter. I find the stable manure best for winter dressing, as it goes further, being little more than well stained straw—and from its warmth, separates more easily in frozen weather than others. I also top-dress very liberally with wheat straw, thinly scattered on poor or galled spots of the wheat field, for which there might not have been a sufficiency of manure. The crop of young clover is insured by such dressing—as I have found plaster to act most efficiently on unrotted manure. I consider all top-dressing more or less injurious to *wheat* (unless harrowed in at the time of sowing, and in that case thoroughly decomposed,) as it affords a nursery for insects during winter, which prey on the crop in early spring.

Let me here take a passing notice of the modern system of reserving all the manure of a farm, for *surface manuring*. Among the objections to this plan, these strike me as most prominent. In the first place, the loss to the land which it is destined to enrich, of the fermenting process under furrow—this I consider material. Then the waste in the manure itself, from evaporation, and *very* often, the total destruction of it from *fire-fang*. Suitable spells for applying it in winter, are precarious—and if the whole offal of a farm, as well as the leaves of woodlands convenient, are converted into manure, it will be found that the ordinary force of a well regulated, and of course, profitable farm, cannot accomplish the hauling and scattering of the *whole* stock. There are other seasons at which the teams and hands of a farm, on which due attention is paid to the division of labor, cannot be profitably employed unless in hauling and collecting manure or materials for it. Few applications of manure are more profitable, I consider, than that of covering the thinner parts of a clover field, after that portion intended for cultivation has been attended to. In these, the clover shoots through the covering before the scorching suns of summer occur, and protects the manure from evaporation, while the plant is generally repaid by the nourishment it receives. To conclude this chapter, let me pay a just tribute to that *multum in parvo*, plaster of Paris. Removed from the benefits so providentially given to the tide water country, in the abundance of marl and lime at command, we should feel that our region was shut out from the face of nature, but for this richest of earthly blessings as a boon bestowed on us, for the wisest and most beneficent of purposes—though by injudicious practice, it has, I am sorry to believe, been productive in *its early abuse*, of as much injury as benefit to dear old Virginia. The practice to which I allude is that, of first stimulating the earth to an unnatural product of clover, and then robbing it of every spice—the result of this great effort—by the scythe and grazing, unaided by standing pasture, which is indispensable to *any improving* system.

I have thus, Mr. Editor, given you a faithful transcript of this record of my *practice*, as far as it goes. Could it have been abridged without mutilation, or doing violence to the unpretending object of the writer, it would have been: and I may add, should its destination, in a luckless moment to your readers, be the columns of the Register, instead of its more appropriate *shelf*, they may be assured, that tedious as is the task its perusal imposes, *they can not* be more objects of commiseration, than he who seeks in so dull a detail a solace from labors that he would fain forget, in that crowning reward of the farmer's toil, which a domestic fireside *alone* can give.

James River having gathered into her garners the greatest share of the profits of Virginia agriculture, and her farmers occupying, justly, the highest eminence of its fame—far as I am from detracting from either, especially the latter ascription—I should be recreant to the land of my adoption, were I to withhold from it the designation of my signature.

RIVANNA.

From the Genesee Farmer.

MANUFACTURE OF IRON.

At a time when all the world is awake on the subject of rail roads, and the mania respecting them promises to be as extensive as that which once existed for canals—when companies for their construction have been incorporated in Great Britain, sufficient to consume all the iron that can be produced in that country for two years to come—when more than 3000 miles have been projected in this country, for the iron of which we depended on foreign countries, but for which recent events show we must mainly rely on ourselves, it is matter of congratulation that a process has been discovered which will greatly reduce the price of the article, by nearly doubling the quantity which a given amount of labor and cost will produce.

This improvement has been introduced by Mr. Nielson of Scotland, and consists in *heating the air* used for the blast of the smelting furnaces. It is effected by passing the air from the bellows through red hot cast iron pipes, by which its temperature is raised to 6 or 700 degrees of Fahrenheit, and the current will melt lead and sometimes zinc. Formerly it was necessary to convert the coal into coke, by which about one half its weight was lost; now the coal is itself used, and this great loss is averted. In 1829, by the old method, three furnaces produced 111 tons of iron, using 403 tons of coke, to make which required 888 tons of coal. In 1835, by the new method, four furnaces made 245 tons of iron, using only 554 tons of coal. So intense is the heat produced, that to prevent the melting of the cast iron lining near the nozzles of the blow pipes, it has become necessary to substitute for the solid lining a hollow one, through which cold water is constantly passing.

The theory of the operation of the heated air is thus explained by Dr. Clark. By an examination of the quantity of air consumed at the Calder iron works, he found that 2867 cubic feet per minute was used, which at the temperature of 50° Fahrenheit, would weigh two cwt., or six tons of air an hour. This quantity of cold air thrown into the furnace acts as a prodigious refrigeratory on the hottest part of the mass, and must materially reduce its temperature. By previously heating this current of air, it is at liberty to act in promoting combustion, without robbing that combustion of any of the heat thus produced.

From the New York Express.

GEOLOGICAL WONDER.

At the United States Quarry in the village of Kennebunkport, Maine, where they are now quarrying large quantities of a strong, rich and beautiful granite—take it altogether, perhaps the very *best* building material on earth, inasmuch as with all its other good qualities, it rings like cast iron, works admirably and easily, and has been subjected to a heat of seven hundred by Professor Cleaveland, without flinching—the workmen have just discovered a rift or dike, which, had it been planned by the most skilful engineer, and executed at a cost of fifty thousand dollars, for the sole purpose of draining the quarry, and enabling the proprietors to work it to advantage, could not have been more judiciously contrived or executed. It has been cleared to the depth of twelve or thirteen feet in one place, and thoroughly sounded through its whole extent—is about six feet in width, of unknown depth, full of loose earth, which may be shovelled out, leaving a *straight, smooth, perpendicular wall* on each side, the whole extent of the quarry. It is now under contract, and will be finished to the depth of twenty or twenty-five feet in some places, by the first of January, 1837. A covered drain will be left as they proceed. Thus it is that nature—perhaps it were not irreverent to say the God of Nature—provides, ages and ages beforehand, for the wants of man! This dike, or fissure, which must have been caused by an earthquake, or some other tremendous convulsion of our earth, centuries ago, for the walls are too smooth, and the soil too loose and uniform, to admit of almost any other supposition, will be of immense advantage to the quarry, and could not have been *imitated* even by blasting, which would have ruined thousands and thousands of tons of this beautiful stone at an outlay of not less than fifty or a hundred thousand dollars.

I observed at the stone yard of another company (the Kennebunk Rail Road and Granite Company,) who are at work in the neighborhood of the United States quarry, (which by the way belongs to the Maine Quarrying Association—) a most beautiful front of hammered stone, intended for your Lafayette Place. I know not when I have seen a better work, or a material to be compared with it; and yet I am satisfied that a much darker and richer stone will yet be obtained at this quarry as well as at the other, where the dike has just been discovered. I am told moreover, that Cox, Marshall & Co. North River, part proprietors of the United States Quarry, have put up some forty stores in different parts of New York this year, and that they are now building a magnificent hotel of the same. This is as it should be—but the stone they have been able to get hitherto, is altogether inferior to that which they are quarrying now. With the resources of Maine, and the capital of New York, wisely and cautiously applied, what may be done !

From the Silkworm.

THE MULBERRY IMPORTED FROM FRANCE BY MR. WHITMARSH.

[We cannot concur with the Editor of the *Silkworm* in admitting the least possible excuse for the conduct which he exposes in the following statement. A cheat has been perpetrated—most shameful in its manner, and enormous in amount and possible ill consequences to the new silk business of our country. Even if it were *credible* that a person so well informed as Mr. Whitmarsh is said below to be, on this subject, could have been so *deceived* by others, as soon as he knew of the fraud, he ought to have hastened to expose it fully, and to offer pecuniary compensation to all purchasers, to the full amount to which *he had profited* by the fraud. By not doing this—and still more by continuing to maintain the value of his "Chinese Mulberry" seeds and plants, by a new description, Mr. W. has fully established his claim to the highest place among the numerous tribe of *wooden nutmeg venders*. Ed. Far. Reg.]

Many persons have expressed their disappointment, and consequent dissatisfaction, respecting the seed and trees purchased from the stock imported by Mr. Whitmarsh, and sold by him and his agents, as the *Chinese Mulberry;* and several have named it with angry feelings, as a fraud which ought to be exposed.

It is not the object of the "Silkworm" to investigate the conduct or characters of persons, either public or private; and if it were, it would be a painful task to the editor: but justice to the little insect whose name the publication bears, as well as to those individuals who are devoting their time and property to its propagation, in the honest hope of gain thereby, renders it the editor's duty, as a faithful purveyor, to omit no effort conducive of a supply of the best food, and to expose as far as possible, every attempt, from speculation or any other motive, which may counteract that important object.

Mr. Whitmarsh is a gentleman whose character, it is believed, stood fair before the public, previously to this transaction; and the deep interest he has taken in the silk business has given his name considerable celebrity. That celebrity, while it serves justly as a shield from the imputation of an improper act, would also serve in an equal degree, if he were disposed to commit that act, to increase his power to give it more extension, and consequently more injurious effect. Every person should be considered innocent until proven to be guilty. If Mr. W. is innocent of the charges against him, it will be doing him a kindness to give an explicit statement of the complaints, that he may meet them with his defence. At any rate the great importance of the silk interest requires that it be guarded against its imposition.

The white Italian mulberry was of Chinese origin, and is as well entitled to the appellation of Chinese mulberry as the Morus Multicaulis. But the recent arrival of the latter in this country, and its annunciation, *with all its blushing honors* "thick upon it," as the *Chinese Mulberry*, at the most critical moment in the silk history, which can ever occur, has identified the Chinese mulberry and the Morus Multicaulis with a kind of sacredness not to be violated without doing injustice to the feelings of every friend to the silk interest in America.

At the time of Mr. W.'s departure for France, the seed of the Chinese Mulberry, was a thing sought after above all earthy treasures, so much so, that $500 per pound have been offered for it, and the young trees were worth $300 per thousand; and their estimated value has rather increased than diminished. Mr. W. must have known these facts, both in reality and in prospect. In the possession of this knowledge, he purchased in France, or elsewhere, a quantity of seed, and of young trees of some kind. The seeds were put up in small papers of about one quarter of an ounce each, and labelled in French as the Chinese Mulberry. These trees and seeds were shipped to New York and announced for sale, by his agent there, and by others at Northampton. They were sought after, and bought with unexampled avidity. Whether the trees were of the true Morus Multicaulis or not, we have no means of determining. We procured a few of them, and set them in our nursery, and many of our friends did the same; but as no one of them that we have heard from, lived, we have no means of judging to what species in the horticultural catalogue they belonged. Fortunately, however, owing to some seasonable caution, our investment in them was small. But not exactly so with the seed. We purchased fourteen papers, amounting to seventy dollars. These were sowed in excellent land, with every precaution which could ensure success. The papers contained a little over 2000 seeds each; of these seeds about 700 came up, which amounted to one seed in forty of those sowed. With the most careful attendance some of them have grown to about a foot in height. They appear very similar to the seedlings of the white mulberry grown by the side of them, but show no relationship to the Morus Multicaulis. The same results have followed in every instance we have heard from. Not a single tree has lived that we know of. From the reports we have obtained of the seeds, they have vegetated in about the same proportion —one to forty, and the product is the same; little, if any, dissimilar to the common white mulberry —altogether different from the Morus Multicaulis.

The true measure of value in any commodity is the mean rate in the estimation of its possessor, and of those who may become so. The comparative value of the Chinese and white mulberries differs as much in the public estimation, and probably in the ultimate estimation of truth, as gold and copper—at any rate, more than copper and silver.

That Mr. Whitmash well knew the state of the public mind with respect to the Morus Multicaulis, and also that the names Morus Multicaulis and Chinese Mulberry were considered perfectly synonimous, it would be absurd to doubt. That he did procure, or that somebody in his name did procure, young trees, of some kind, and sell them in a state so dry and decayed that few if any have lived to declare their species—that seeds of some kind were thus procured and sold in his name to a vast amount at about $160 per pound, knowing that the purchasers considered them the true Morus Multicaulis, and bought them as such, are also facts not to be doubted.

Now, it is possible that Mr. W. may have been imposed upon in his purchase of seeds and trees, and had no intention to deceive the public: at least we wish it may appear so. But at any rate the public has been most egregiously deceived.

It is in vain that the Northampton prints announce to the public, when the transaction is all over, that there is no deception; that they were the Chinese Mulberry—not the Morus Multicaulis, but a better kind. With similar grace, the honest Jew pedler sells a *cold vatch*, well knowing that he is understood to mean a gold watch. The reputation of the Chinese Mulberry stands too high to be injured by speculation.

We impute no dishonest intentions to Mr. Whitmarsh, or to any one else in particular. We have only stated facts, which show that there has been deception somewhere.—Ed. S. W.

From the Genesee Farmer.

LEAVES OF TREES FODDER FOR CATTLE.

A remarkable feature in the agriculture of France, and in most warm countries, is the use of leaves of trees as food for cattle. Not only are mulberry, olive, poplar, vine and other leaves gathered in autumn, when they begin to change color, and acquire a sweetness of taste; but spray is cut green in July, dried in the sun or in the shade of trees in woods, fagoted and stacked for winter use. During that season they are given to sheep and cattle like hay; and sometimes boiled with grain or bran, to cows. The astringency of some leaves, as the oak, is esteemed medical, especially for sheep.

From the Western Farmer.

ON TRANSPLANTING.

There is no operation more important to the agriculturist than that of planting out fruit trees; because, if properly performed, the benefits of the operation are for himself and for his posterity. Hence the damage of introducing improper practices, founded upon unsound principles in planting.

Having observed in your November number of the Western Farmer, some "Notes on Transplanting," copied from the New York Farmer, recommending the planting out of trees without lopping off any part of the top or branches—and apprehending that the reasoning in favor of that practice is incorrect, and might mislead, to their injury, the confiding and inexperienced, I beg leave to offer a few observations on the subject.

The author of these "Notes," it appears to me, reasons badly, when he draws an argument in favor of his new theory, from the fact of the greater success in planting a young tree "with its limbs and roots entire," than "the larger one with the system of decapitation practised upon it." He infers that the difference arises from the amputation of the branches—whereas it proceeds from the greater loss of the roots, in digging up the larger, than the young tree. In removing a young plant it is quite practicable to retain a much larger proportion of the extremities of the small fibrous roots, adapted to the introsusception of the plant, than of a large tree. There can be no doubt that the roots are more essentially the life-sustaining members of plants than the branches—therefore, when a tree (small or great) is removed, the chance of its living depends more upon retaining a due proportion of its most essential members.

The soundness of theories may sometimes be tested by pushing the principles on which they rest to their extremes. Let us see whether the theory here controverted can stand this test.—Plant a young tree with its branches and roots entire—it will live. Cut off a branch, it will live—cut off several, it will still live—nay, cut off the whole, leaving only the stem, and it will not only survive, as a thousand instances have proved, but being sustained by the roots, it will put new branches and will flourish.

Plant another tree with its branches and roots entire—try the same process of amputation on the roots—and ere you reach the last root, the branches will wither, and the tree will decline and die.

An argument in favor of the new theory is attempted to be founded on a supposed analogy between vegetable and animal life. "But (says its author,) would any person in his senses think of cutting off a child's arm, because it had the misfortune to lose its foot?" Certainly the author of the notes, in this question, loses sight entirely of the supposed analogy. The food of an animal is not constituted an organ to receive through its pores nourishment for the sustenance of the body, as the roots are of a tree. The stomach of an animal is this organ. Now let as suppose the stomach to be wounded or impaired, so as not to be able to perform adequately the functions of receiving, preparing, and furnishing the body a due portion of food. What is the consequence? Why, by an invariable law of nature, the bulk of substance to be supported must be reduced, the body and limbs fall alway, and dwindle sometimes almost to a skeleton. But when the stomach recovers its tone, and performs properly its functions, then the body and limbs begin to recover, and finally assume their wonted size and fulness. So when the roots of a tree have been reduced or impaired, to a degree which leaves them incapable of supplying adequate nourishment for the whole tree, body and limbs, the same law of nature ordains, that a portion of the substance to be supported, must be reduced—the limbs wither, dry, and decay: and who ever yet saw a dry dead twig, restored so as to vegetate?

As then, in the cases supposed, art is *incapable* of reducing the bulk of the animal, but nature is competent both to reduce and restore—as art is capable of reducing the bulk of the tree, leaving only as much as can be supported by the appendant root—and as reduction, of the bulk to be supported, is indicated in both cases when the sustaining organs are impaired, it would seem that the analogy is clearly in favor of trimming off a portion of the limbs, so as to leave the top of the tree proportioned to the remaining root.

But further—is not this new theory entirely at war with the system of pruning done for the double purpose of preserving the tree, and improving the fruit—a system which has stood the test of ages, and has the sanction of experience, the best guide to young agriculturists.

But facts are the best arguments in these matters; about 30 years ago, I transplanted a pear tree into my garden. It was seven inches through, dug up in December in freezing weather. To save it, I trimmed off most of the top, so much as to admit of its being carried into a cellar to preserve it for the night from the frost. Next day it was carried a mile and planted. It is yet a good bearing tree. About ten years past I transplanted a bearing Junetting apple tree more than half grown, cutting off most of the top. This year it bore the best and largest apples of any Junetting tree in my orchard.

Some four or five years past, a neighbor of mine transplanted from the forest to his yard a very uncommon and beautiful tree, bearing berries: desirous of saving the top, he trimmed off none, and the tree died.

Such facts could be advanced without number.

A CURE FOR THE RED ANTS.

The evils of this little visitant are well known to perhaps every house wife, and perhaps nothing would more exhilirate the domestic circle than the discovery of a remedy for the red ants. Such discovery I have made and wish you to communicate to the public through your useful paper. Common salt is a complete barrier to the approach of the red ant. Let the salt be so placed that they cannot approach the place from which you wish to exclude them without passing over it, and the remedy is complete. For instance, if you wish to exclude them from the cellar cupboard or any moveable cupboard, if it has no legs make artificial legs to your cupboard, then provide something suitable to hold for each leg of the cupboard, a pint or quart of salt, in which place the legs of the cupboard, and set it free from every thing else so that nothing can creep on to it without passing over the salt, and the remedy is complete. Having tested this remedy for two seasons I have no hesitation in recommending it as a complete cure. *Worcester Ægis.*

SCIENTIFIC DISCOVERY—SOLID AIR.

At a late sitting of the French Academy, there were presented some specimens of solid air. Every one could touch and handle them, see them dissolve, escape from the fingers and recover again the state of gas without leaving any traces. The pieces were divided, distributed, every body could taste them, and feel the impression of extraordinary cold which a solid gas produces, when returning to the state of air; or rather it was observed with surprise, that a substance, the touch of which congeals mercury and spirits of wine, and causes the thermometer to descend to 90 degrees below zero, did not produce on our organs of sensation the cold that might have been expected. It would seem as if our senses were not capable of appreciating such a low degree of the atmosphere; it is a new sensation which is unknown to them, and which they are unable, so to speak, to describe.

We have said that there were specimens of solid air, but it was not the atmospheric air, the air that we breathe, which was shown by piece meal to the academy, but we so speak of it, to make more apparent what there is remarkable, and truly astonishing in the fact. For people in general, there is but one sort of air, that which surrounds us, and if we had said that we had succeeded in making solid gas, this fact would appear very simple, and would perhaps pass unnoticed. It would be thought that gas is a chemical production which can bend to its laws, and whose condition can be altered by the scientific at will, without having any right to call for the attention of world. As to the air which we breathe, it still enjoys its reputation as an element—it is one of the powers of nature—it is one of the great constituent bodies of the world, and if we learn that man has succeeded in governing it, changing its condition, we expect to see him overturning the order and harmony of things. We forget that air is a gas like any other, a compound gas, which has not resisted the agents of decomposition at the disposal of the learned. To be more explicit, the carbonic acid gas, formerly known under the name of fixed air, of which we breathe a certain quantity in the surrounding air, is the true air which has been compressed, the little particles of which are drawn together, to the state of water in the first place, and then made solid, as water itself becomes solid in freezing.

It is from an enormous cylinder of cast iron, capable of bearing a pressure of more than 60 atmospheres, that M. Thiorien has obtained the liquid carbonic gas. By allowing the gas to escape through a very small tube, it is seen to spread itself out under the form of a snowy vapor—it is sufficient then to direct the flowing of this vapor into a tin box, when it may be seen to unite itself, becomes a mass, and soon it may be collected, pressed like common snow, and placed in a glass vase. It was under this form that the solid carbonic acid was presented to the Institute by M. Delong, to whom M. Thiorien handed several masses which he obtained from his apparatus, placed in an apartment adjoining the hall where the Academy was in session. We cannot sufficiently applaud the perseverance and devotedness of the author of this discovery. Much courage is necessary to manage an apparatus so powerful and so dangerous.

ON THE SOILS SUITABLE FOR COTTON, TOBACCO, SUGAR, AND THE TEA-PLANT.

By H. Piddington.

Read to the Agricultural and Horticultural Society of India, 5th March.

[We are indebted to Dr. Richard Harlan of Philadelphia, for the following recent communication to the Agricultural and Horticultural Society of India.

It will be gratifying to every agriculturist who has devoted much inquiry to the nature and constitution of soils, to find that an intelligent observer and practical chemist, like Mr. Piddington, is engaged zealously in that investigation. Though we do not agree with all his particular conclusions here stated, the facts from which he deduces them are valuable; and such observations, continued, cannot fail to lead to correct and instructive results. But though believing Mr. P. to be mistaken, (and no wonder that he should be, when he is compelled to reason from so few facts—) we fully concur in his general opinion, that it is all-important to know what are both the actual and the desirable chemical properties of soils, for the purpose of being enabled to succeed in producing, in perfection, most of the valuable crops. For some, lime in some form is important, as in the case of wheat—or absolutely necessary, as for clover—or necessary in great quantity, as for sainfoin. For some of these, gypsum is also absolutely necessary to produce a full crop, while to most others, it is of no service. Every valuable crop is made better, by the soil having a moderate proportion of lime in some form—because no soil can be a good one without. But most crops, and cotton is one, contrary to Mr. Piddington's inferences, require but a small, if any, amount of lime in the form of the carbonate, (or such as will show effervescence with acids,) though they will grow well in highly calcareous soils. Thus cotton is the great market crop on the excessively calcareous prairie soils of Alabama, and also on the acid pine soils, (showing not a trace of carbonate of lime,) of the Carolinas, and part of south-eastern Virginia. We have in different parts of this work, stated our reasons for believing that a highly calcareous soil is essential to grape and wine culture—and have attributed the general ill-success of that culture in America, to the fact, that no vineyard here, has such soil. We also stated the belief that calcareous soil is unsuitable to tobacco—and that the superior flavor of American tobacco to any made in Europe, is probably owing to this general difference of composition in the soils of the two countries.

Mr. Piddington is anxious to obtain, and requests through Dr. Harlan, specimens of tobacco soils from Virginia, and of cotton soils from South Carolina—such, it may be presumed, as are most friendly to both these crops. It is hoped, that some of the readers of the Register, whose location and opportunities permit, will comply with this request, and aid Mr. P.'s future investigations, by selecting and minutely describing the specimens, and sending them to the care of Dr. Richard Harlan, Philadelphia.]

I preface what I have to say to the Society on the soils placed on the table with a few remarks, which I trust may be thought worth placing on record. My object in doing so, is again to impress upon members, of what vital importance it is to the advancement of the agricultural interests of the country, and to the safety and success of every agricultural speculation, to procure samples of all soils from other countries in which valuable products grow.

The same climate and soil are, we know, in a greater or less degree, the essential requisites for obtaining the productions of one country in another; and for our present purpose, we may, perhaps, say that plants *find* their food in the soil, and are enabled to *digest* it by the climate. They *do* digest we know, and this in the strictest sense of the word.

The popular ideas of climate are vague enough, but it may be roundly asserted, that scarcely one who uses the word, knows what is really meant by soil; or rather, what is really meant by "the *same* soil." This arises from our vague notion of the thing itself. The very words used to distinguish soils, express more frequently than any thing else, their appearance and some of their physical qualities; scarcely any their essential—that is, their chemical properties. We talk of light and heavy, of sandy and clayey, moist and dry soils, which are all physical properties, and two clayey, or two sandy soils, may be actually as different as light and darkness from each other! The words ferruginous and calcareous are, it is true, chemical terms, but such vague ones that they designate whole *classes* of soils, of which, each sort is widely different from its neighbors. The tea soils and the Arracan tobacco soils on the table are both ferruginous soils, but differing as widely as soils can do; for the iron in the one, is a carbonate of iron, and in the other, the red oxide of iron.

Cotton.—Nothing then but a sample of the soil and a correct analysis of it can assure the speculator, that while he is trying to rear any given foreign product, he is not (misled by loose names) absolutely blundering in darkness, and attempting an impossibility. I begin with cotton as a most prominent example, though my proofs on the subject are not quite so full as I could wish; and I shall surprise the society not a little, when I say, that all the expensive efforts which have been made hitherto to obtain good cotton, have probably failed from this one cause—*that we have been at work on the wrong soil!* How far, with the American cottons, differences of climate may also have operated, is not here the place to examine, but vegetable productions do, to a great extent, acclimate themselves; while it is probable, that nothing can compensate to them the want of a principal constituent of the soil. Now I have not been able to obtain specimens of the American cotton soils, but I have good authority for stating that the soil of the Sea Islands is wholly a calcareous sand—in other words, a light chalky or shelly soil; so that it may probably contain from 50 to 60 per cent. of calcareous matter, (lime generally in the state of chalk,) and we have been attempting to grow this cotton on a soil which barely contains a trace of it! The soil of the Botanic Garden, for instance, not containing more than 1½ or 2 per cent: Indeed, we may say generally, that, till we reach the *Kunkur* districts, none of the soils of lower Bengal, out of the reach of the inundations, contain any great portion of lime. I showed some years ago,* that the inundations deposite lime, and that much of the fertilizing effect they produce is due to it.

The American cotton is then, on account of differences of climate, a case not strictly in point: but the Bourbon cotton—grown both at Bourbon and the Mauritius—which sells for a shilling, when the Sea Island sells for 13½d. and the Manilla cotton which sells for 11d. when the Bourbon is worth a shilling, are both cottons of hot climates like our own; and both these are grown in highly calcareous soils. The soil on the table before you is from the Mauritius, it is sent me by M. Geneve, of La Riviere Noire, one of the finest estates on the island, as an excellent cotton soil, and contains 32 per cent. of carbonate of lime; (or in plain English, one-third chalk,) there is, moreover, phosphate, and perhaps sulphate of lime; altogether, perhaps, not less than 40 per cent. of calcareous matter! Its iron too is in a peculiar state, that of protoxide, or the black oxide of iron; and in this respect, it probably resembles the black cotton soils of Southern India. No wonder that the Bourbon cotton, though it grows well in many of our gardens near town, where it meets with plenty of calcareous matter amongst the lime-rubbish with which most of them are filled, is said to degenerate when cultivated in the open fields which do not contain 2 per cent. of lime. I know, from the experience of several years, that it does *not* degenerate, if it is duly supplied with calcareous matter; but that it will produce most abundantly, and for years, cotton worth from 10d. to 11d. per lb. in a proper soil. If the soil does not suit it, it will produce little else than leaves and wood, and the staple will deteriorate. Samples of American cotton soils are wanting now, to make our theory on this head perfect; but I would advise no man to attempt foreign cottons in a soil containing less than 15 per cent. of lime, and its iron mostly in the state of protoxide, or black oxide.

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* Trans. of the Physical Class As. So. Vol. 1.

Tobacco.—Tobacco soils are the next, and here we are more fortunate, for there are on the table soils from Arracan, (Sandoway,) a soil from Singour in Burdwan, near Chandernagore, the tobacco of which, though of the same species as that of the surrounding country, sells at the price of the Arracan sort! and the soil of the best Bengal tobacco, which is grown at and about Hinglee in the Kisnagor district, near factories formerly held by me. Col. Hezeta and Dr. Casanova are our authorities for saying that the tobacco soils of the Havana are *red* soils, and those of Manilla, I know are also *red* soil. Now the red and reddish brown soils contain most of their iron in the state of peroxide, or the reddish brown oxide of iron; while the light grey soils contain it only in the state of protoxide, or the black oxide of iron. I believe the quality of the tobacco to depend mainly on the state and quantity of the iron in the soil; while it is indifferent about the lime, which we have seen is so essential to cotton. None of these tobacco soils contain any lime. Their analysis shows them contain—

	Arracan soil.	Singour soil.	Hinglee soil.
Oxide Iron, (peroxide,)	15.65	10.60	6.00*
Water and Saline Matter,	1.10	0.75	1 50
Vegetable matter and fibres,	3.75	1.10	75
Silex,	76.90	60.65	87.25
Alumina,	2.00	4.50	1,50
	99.40	97.60	97.00
Water and Loss,	60	2.40	3.00
	100.00	100.00	100.00

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* Mostly protoxide.

—from which it will be seen that the best tobacco soil we have hitherto found in India, contains 16 per cent., or nearly one-sixth of iron, which is mostly in the state of peroxide, and that the inferior sort of tobacco grows in a soil containing only 6 per cent. or one-sixteenth of iron, which is, moreover, mostly in the state of protoxide or black-oxide.

I thought it worth examining what the quantity of iron in the different sorts of tobacco would be; and I found that, while the ashes of one ounce, or 480 grains, of Havana and Sandoway cheroots gave exactly 1.94 grains or 0.40 per cent. of peroxide of iron, the ashes of the same quantity of the Hinglee or best Bengal tobacco, only gave 1.50 grains, or 0.32 per cent., and it appears to exist in the first two in the state of peroxide, and in the last as a protoxide of iron; rendering it highly probable that the flavor of the tobacco, to the smoker, depends on the state and quantity of the iron it contains! for we have now, observe, traced the iron from the soil into the cheroot. Green copperas water, which is a solution of sulphate of iron, is often used by the American and English tobacconists and planters, to color and flavor their tobacco; and this would be decomposed by the potass of the tobacco, and sulphate of potass and carbonate of iron be formed. Carbonate of iron is of an ochre-yellow color. I took care to ascertain that this process had not been performed with the cheroots used for my experiment; and I do not believe our Bengal cheroot-makers know of this method.

Sugar.—Sugar seems to depend both on the state of the iron and on lime in the soil. The sugar soil before you is also from the Black River, (Mr. Geneve's,) an estate upon which, from 3,000 to 7,000, and even on one spot the astonishing quantity of 12,000 lbs. of sugar have been obtained from an acre, or from 12 to 150 bazar maunds per bigah! Captain Sleeman is my authority for these statements.

Now the peculiarity of this soil is, you will observe, that it is a *red* soil, i. e. that its iron is in the state of peroxide; and it contains, moreover, about 9 per cent. of carbonate of lime, with probably some sulphate and phosphate of lime, say, perhaps, altogether 10 or 12 per cent. of calcareous matter. We have in many instances endeavored to cultivate this cane on soils, destitute both of peroxide of iron and lime, and we complain that the cane has been found watery. It is clear that the cultivator who would succeed in sugar should pay attention to these peculiarities; for without doing so, he may have *returns*, but often no profits. His profits, in a word, may depend upon his canes, his cotton or his tobacco being *fed* with the food which they require. I use the words *feed* and *digest*, because it cannot be too often repeated, that plants are living beings, and that the vigor of their life depends, as with ourselves, on abundant and suitable food.

Tea Soils.—The tea soils, though I notice them last, are not the least interesting. The first, is a soil from Assam, for which I am indebted to Captain Jenkins, and the second, is from the Bohea Hills in China, sent round by Mr. Gordon, the Secretary to the tea committee, and obligingly given to me by Mr. Grant, of the Honorable Company's Export Ware-house. How very alike they seem, you will at once have noticed, and their analysis gives as follows:—

Tea Soils.

	Tea soils of Assam.		Tea soil of China.
	Surface soil.	At 2½ feet deep.	
Water,	2.45	2.00	3.00
Vegetable matter,	1.00	0.80	1.00
Carbonate of Iron,	7.40	6.70	9.90
Alumina,	3.50	5.45	9.10
Silex,	85.40	84.10	76.00
	99.75	99.05	99.00
Traces of phosphate and sulphate of lime, and loss.	25	95	1.00
	100.00	100.00	100.00

There are two peculiarities in these soils, the first, that they contain no carbonate of lime, and only traces of phosphate and sulphate; and the next, that their iron is almost wholly in the state of carbonate of iron—a widely different compound from the simple oxides. They would be called poor yellow loams; and cotton, tobacco or sugar cane, would probably starve upon them; but we find that they suit the tea plant perfectly. It is a striking coincidence, that we should find our tea soils and those of China, so exactly alike.

I fear to grow prolix, though I have much more to say on the subject of soils; I shall therefore break off, trusting that for the present, I have amply shown the necessity of a careful examination of the soil; and that the commercial public, who can do so much for us in this way, will not neglect their own interests in procuring specimens of soils for us; for to go to work in ignorance of this great element of success is absolutely to blunder on in the dark, where chemistry could lend us an unfailing light.

ON THE ORIGIN AND HABITS OF THE CUT-WORM.

To the Editor of the Farmers' Register.

Dear Sir:—In resuming so early, the subject of "Entomology," after the long discourse I lately gave you, on the "Hessian Fly"—and, moreover, laboring under the misfortune in the former, as well as the present instance, of controverting, if not *catholic* opinions, at least such as are very confidently asserted—I fear you will view me in the light of a *polemical heretic*, delighting more to shake the faith of others, than to establish one for myself.

But, to the point—my subject, at present, is the far famed "Cut-Worm."

In your present, November, No. of the "Farmers' Register," I this moment read an extract from the "Cultivator," which, indeed, I had seen *in extenso*, in this inestimable "periodical," in regard to the origin of that destructive insect.

The writer commences his hypothetical remarks, by which, he flatters himself, he has arrived at the truth, by asking the question, "to what species, can they be attributed?" He, then, satisfies himself they are not propagated by the "Coleopterous tribe, (beetle,) because he has examined *several* species of this tribe, and has invariably found their larvæ, of pale yellowish or light brown color; whereas the cut worm, he adds, is nearly black, and very *different* in its *habits*." Upon these vague grounds, and this course of reasoning, he *concludes* it is the "*cicada*."

This entomologist, though deserving of much credit, for his zeal in a branch of science in the common estimation of minor importance, yet, in reality, of much magnitude, has considerably erred in his mode of inquiry, as well as in his conclusions.

The question is, to what order do they belong? These may possibly follow the genus, and finally, the species. And these questions can be answered, by means of *experiment* alone.

His method seems thus; "*several* species of beetle have their "larvæ" of pale yellowish and light brown color—whereas these are nearly black." Therefore he concludes, the origin of the "cut worm" cannot be a "beetle." This argument may be dismissed as a "*non-sequitur*," and needs no further comment. But he adds, "it is very *different in its habits*," from the "coleoptera" order, inasmuch as the "cut-worm is *periodical*," thereby meaning, as subsequently appears, "not annual."

If the "cut worm" be *periodical*, its *periods* are *woefully short*, as the mortifying experience of the farmers of Maryland, at least, will attest. Annually in a greater or less degree, and often *disastrously*, for may successive years, do these grubs lay waste our corn crops, in numbers manifestly dependent on the peculiarity of the seasons, and other such natural and general causes, favorable to their propagation; and not upon any law of "*periodicity*." But in what does the "cut worm" differ (as he alleges,) in its *habits*, from the coleopteras? It is the character of this order to *nidify* in the *ground*! and to *subsist* in the "*worm*" state, upon the *roots*, and *succulent parts* of *vegetables*. Does not the "cut worm" *nidify* and *subsist* in the *same manner*?—Undeniably it does.

Insects of this order, also continue in the noxious "worm state," many as long as one, two, three, and some genera, as long as four years: ("Vid: Goldsmith's Animated Nature, vol. , title, *Beetle*,") devouring the tender roots, stocks and blades of whatever vegetables they meet with, yet, having their preferences. In fact the *whole habits* of the "coleoptera" family characterize the "cut-worm" with the most remarkable precision; and I will presently show "without argumentative assistance," that the gentleman's *conclusions*, as well as his *premises*, are wholly erroneous.

In a No, of the "Cultivator," also of the present month, an anonymous writer, "A Watervliet Farmer," pronounces the origin of the "cut worm" to be a "*moth*." His experiments are too small to be relied on—at first made with *one living* "cut worm," which as he thought, produced a "moth fly;" but he admits "he had a great number of the moth fly in his windows:" these might readily have caused his "moth" chrysalis. Secondly, his "larvæ" produced from his two other "moths," were all, he says, found *dead* when he first discovered them; and from his own narrative, they were too *microscopic*, especially in their lifeless and necessarily contracted condition, to be identified with any degree of certainty.

These gentlemen, without doubt, honestly believe what they have published: the one that he had proved the "cut worm" to originate from the "cicada," an hemiptera; the other as certainly from the "moth," a lepidoptera: and the learned and indefatigable agriculturist, Judge Peters, of Pa., believed and published them to be the product of the "scarabæus volvens," a "coleoptera;" and I feel a *moral certainty*, derived from what I hold to be "*infallible experiment*," that neither the "*cicada*" nor the "*moth*," nor the "*scarabæus volvens*," is the parent of this Gorgon insect.

In consequence of Judge Peters' paper, in which he represents the "scarabæus volvens" (the common tumble bug) to be the parent of the "cut worm," and which he had, no doubt, taken at second hand—I was induced, (in 1819) shortly after his publication, and without any reasoning on the matter, as to what it *might* be, or what it *should* be, to make experimental demonstration of what its origin *really was*—Vid: American Farmer, vol. 1, p. 124—title "Entomology."

I offer below an extract from the paragraph containing this experiment; simply remarking that I have, "since," repeated it with similar results; and I am quite confident that all who will take the trouble to test it will bear witness to its verity.

"To come at the fact, I carried into the cornfield a large transparent bottle, which I half-filled with earth—upon this earth I deposited a dozen of the worms, and gave them corn plants to feed upon. In a few weeks they disappeared. I searched the earth and found them "chrysalids" enveloped in balls of earth. A considerable time after I again examined them, and found several of them matured into the imago, or *parent* bug, and extricated from their *envelopes;* others in the state of a soft "pupa," with limbs more or less distinctly formed, in various stages of progression, and exhibiting unequivocal proofs of their origin, and of the impossibility of mistake or deception. These destructive animals belong to the order "coleoptera" of Linn., having crustaceous elytra, or wing cases, which shut together and form a longitudinal suture down the back. They are about one quarter of an inch long, generally, and of a shining jet black color, very quick and active in their movements; in fact, the same identical bugs that are seen in vast numbers under wheat stacks, and in wheat yards. The brief history of this insect is, that its larva having fed upon the young corn, or other delicate plants, descends into the earth about the depth of four inches, where it assumes its state of "*chrysalis*," in which it continues till about the first of July, and no doubt, a shorter or longer period, as the weather may be more or less favorable—when it becomes transformed into the imago or parent, which in autumn deposites its eggs in the field, to undergo a similar series of transitions, which is effected by the heat of the ensuing season.

"The obvious *preventive* is *fall* or *winter ploughing* at such a depth as will turn up, and expose to the frost, the eggs, whereby they must perish."

The above *preventive* was not offered as original, it had before been practiced, perhaps by many, and its effects had fallen short of their hopes; first, by the imperfect method of too *shallow* a *furrow*, and too *wide* a *slice*, whereby the eggs were not sufficiently exposed. Secondly, because the eggs of all insects are, unfortunately, so tenacious of the principle of *vitality*, as to resist a degree of cold incredible to those who have not witnessed the fact: yet having long practised the proposed preventive, I can say in the fullest truth, that when the work was well executed, and a very *mild winter* did not ensue, I have received a full equivalent for the labor.

Finally, I must apologize for subjoining my name contrary to the general custom, "I perceive," of your correspondents. May I presume to ask what motive can occasion this custom? Certainly an *anonymous* statement of *facts*, or even of *opinions*, carries with it less confidence than one which offers the *responsibility* of a *name;* and with diminished confidence, the purpose is diminished in effect. The name freely tendered, "of a witness to facts," is a considerable assurance of, at least, a *belief* of their truth; he may be deceived, but it is justly said '*humanum est errare;*' and ordinary liberality will not impute to him a wanton misrepresentation of his impression of facts. Modesty is commendable; but in this custom, there is rather something of the "*mauvaise honte.*" As well may a public speaker, or a witness in court, conceal his identity behind a curtain. The *cause*, and the *effect* would seem to be the same. Excuse these remarks and believe me,

Yours respectfully,

JOSEPH E. MUSE.

Cambridge, Md., Nov. 20, 1836.

For the Farmers' Register.

THE DIFFERENT ADVANTAGES OF LARGE AND SMALL FARMS CONSIDERED; AND THE INJURIES CAUSED TO AGRICULTURE, AND TO A NATION, BY FREQUENT AND INJUDICIOUS CHANGES IN THE OUTLINES AND LIMITS OF FARMS.

The statesman who plans and achieves an important change in any of the political institutions of his country, is rarely able to foresee the effects and extent of its future operation. However hurtful may have been an old abuse, its removal has probably introduced other unexpected evils, which though of less magnitude, serve at least to detract from the benefits of the change. This truism is not a reason for opposing all proposed reformations—but it directs us to enter on even the most plausible, with the utmost caution and circumspection—and to doubt the existence of alleged universal and unmixed good effects of any past changes, until long experience shall have confirmed the truth of such opinions. The institutions which have long directed the accumulation and distribution of property, are the most endangered by the tampering of political reformers. It is in the regulation of property that errors are almost impossible to correct, even when their disastrous consequences have become apparent and certain.

The manner in which land has been distributed among the inhabitants of any country, and the degree of permanency with which land-marks are preserved, and existing possessions are held, produce all-important effects on the interests of agriculture, and on the prosperity of an agricultural nation. Yet this action has been scarcely noticed by those who have either caused, or suffered, the most effectual attacks on the interests of agriculture. Whenever the distribution of landed property has been changed, whether by patriotic statesmen, or self-interested demagogues, the future effects on *personal* rights and power were only considered. There is no measure of our government to which these general remarks apply, more truly than to the destruction of entails and the right of primogeniture, in Virginia. The principal object of this measure, (and probably the only effect foreseen by the great statesman and pure patriot who proposed and carried it through,) was to insure the preservation of the equal political power of the people, by putting down forever the influence of the "landed aristocracy." But while the general, and repeated division of land was producing its intended and legitimate object, it has also been slowly and silently, but most effectually, assailing the agricultural prosperity of Virginia. This opinion will meet with few avowed advocates—indeed, not one, unless he is both fearless of popular censure, and careless or hopeless of popular applause.

Passing by the most apparent political tendencies and benefits of our existing legal policy of distributing lands, as a measure of state, I shall proceed to inquire into the incidental and unnoticed operation of the system on agriculture; and, through agriculture, on the public wealth and prosperity. It is not my intention to treat the question, (though well it deserves such extended examination,) as belonging to politics or government, or morals—nor as affecting the feelings, prejudices, and happiness of individuals—but simply as a disputable point in political economy, particularly involving the interests of agriculture.

It has long been a subject for discussion, whether large or small farms are most profitable to their owners, and consequently most conducive to public wealth. In Britain, particularly, this discussion has engaged the attention of every able modern writer on agriculture; and every fact and argument have been adduced, which could be brought to support either side. There, strong reasons could be urged in favor of small farms, (say of 30 to 200 acres) which would not apply to us: as for example—that the cultivated parts of the island were already generally divided into small farms, and that a great sacrifice of fixed capital (in houses, fences, &c.) would be caused by throwing 10 or 12 such farms into one: that the laborers on large farms were discouraged from marrying, and in consequence, that the increase of population would be obstructed, and the morals of the laboring class thereby injured. But notwithstanding these reasons, which cannot apply to a slaveholding country, and also other reasons, which are of general application, it is the decision of the most enlightened agriculturists of England and Scotland, that large farms are most profitable for the owner, the occupier, and also for the nation.

This deduction may be right, or wrong: and at any rate, I do not advocate the adoption of such opinions on mere authority, though supported by such names as those of Young, Sinclair, Brown, and Coke. But *if* their opinion is correct, that small farms are least profitable, where land is rich, and its product is sold for high prices—where the system of landlord and tenant is almost universal—where small farms were already general—where the laborers were free, and the farmers themselves were accustomed to aid as well as to superintend the performance of every operation—then much more certain must be this truth in this country, where all these circumstances are found reversed. But let us examine our situation in this respect, without reference to, or comparison with other countries.

Both large and small farms possess peculiar and opposite advantages; and the interests of a country would be greatly injured, by its land being universally, or even very generally, kept in either very large or very small divisions. Let me not therefore be misunderstood as supporting a state of things equally absurd in theory and impossible in practice, when I shall state the peculiar advantages of either plan of division, or contend for the superiority, in particular respects, of the one size over the other. It is also requisite, in discussing the respective advantages of large and small farms, to dismiss from our minds every argument built on the personal and peculiar characters of different individuals. An industrious, economical, and intelligent farmer, however inconveniently situated, may derive more income from his capital than his indolent and wasteful neighbor, possessing ten-fold advantages: and yet no such fact, nor any number of them, will prove the situation in which the former was placed, to be better than that of the latter.

The small farmer, who works only one or two horses and three or four laborers, and who himself labors as well as directs, possesses the great advantage of being able to exercise the most perfect economy and industry in the management of his farm. If he drives, feeds and stables his own horses, he can derive the utmost amount from their labor, and they, the greatest benefit from his care and attention. Almost nothing is lost by waste or neglect, because the farmer can see, or attend every thing. All the various little savings from such sources, are sufficient to cause the provisions, stock and labor of the small farmer, to be more efficient *in the particular manner in which they are directed*, than an equal amount of capital employed as part of the expense of a large farm. But the manner, or plan, of directing capital and labor on small farms, is necessarily and greatly inferior to that on large farms, for reasons that will presently be offered. By making the best use of the economical advantages just alluded to, many of the small farmers of Augusta county are more thriving than most of our richest landholders: and if most of our farms were as small, and all their cultivators showed the same untiring industry and frugality, no doubt there would be a great increase of individual profit, and public wealth, in spite of all the disadvantages inseparable from small farms. But unfortunately, such examples are rare, because there are rarely found farmers so admirable for frugality and industry: and when the owner is lazy, improvident, or drunken, all the net income of a small farm will speedily vanish. In every case, the personal habits of the cultivator, whether good or bad, must more immediately affect the net product of a small than a large farm.

But notwithstanding the superior advantages that small farms enjoy, in many respects, it is still undeniable that on them the operations of agriculture can never be well performed, nor can the greatest net products be derived, nor the most valuable improved processes carried on, for want of the skill which only a division of labor can produce; and still more, for the want of the best utensils, machinery &c., which can only be used on large farms. It is well known that the profits of all complicated manufactures depend greatly on the extent of the establishment: for example, that a cotton factory may be highly profitable if suited to employ 200 laborers, and yet ruinous if the works were erected only to employ 20, because many expenses to be incurred must be nearly as heavy in the small, as the large establishment. Precisely the same causes of profit and loss are to be found in the extent of the operations on different farms.

Let us suppose the existence of two neighboring farms of the average fertility, (or rather I should say, the average poverty,) of lower Virginia, and similarly situated, except that one is in size 1000 acres, and the other only 100, and both cultivated by slaves, in numbers suited to the respective farms. On the first, the owner can afford, (and the expense is for him true economy,) to keep good teams, the best ploughs, and a wagon to convey his crops to market. He has sufficient farm-houses, and costly machines of the best construction suited to prepare his crops for market, such as a thrashing machine and fanners for wheat, or a good gin and press for cotton, &c. His income permits his employing an overseer of the best mind and habits that can be obtained. His extensive operations enable him to profit by the division of labor, and thereby improve to the utmost the skill of his laborers, each in his respective department. It is not every man who can learn to be a first rate ploughman, and for even those so gifted, long practice with good implements is indispensible. In the case we are supposing, a few men selected for their qualities from thrice their number, are kept through a large portion of year at ploughing, and have every means to perform perfectly that operation, upon which so much of the success of tillage depends. The same remark applies to every other operation, for which good or expensive utensils, and much skill in using them, are required. When accidents or disasters occur, by which the cultivation of a large farmer loses labor, implements, or even expensive fixtures, his income enables him to supply the deficiency, without incurring the still greater loss that would probably be caused by delay, or the inability to remedy the evil. He is not compelled to sell his crops at inconvenient times, or at the lowest prices, but may supply the market according to the demand existing, greatly to the benefit of the public as well as himself. Similar examples might be greatly extended, but these will suffice for the purpose of comparison: and in every such case, an application of the same circumstance to the small farmer will make evident the unavoidable disadvantages under which he labors.

If the owner of 100 acres makes wheat, he must prepare it for market by the slow and wasteful process of treading out by horses, as his crop is not large enough to justify the expense of a thrashing machine; and if he had one, his laborers would be too few and too unskilful to use it. Implements of less value, and suitable teams, he may (and certainly ought to) have; but the fact is notorious, that on such a farm, and on many much larger, it is very uncommon to find either a good fanner, plough, harrow, or a well matched pair of horses. There can be scarcely any division of labor, nor of the skill caused by it, as of the two or three men employed, each has to do something of almost evry operation. From these causes every process will be performed not only imperfectly, but at great loss of labor, and perhaps of crop also. If the owner employs an overseer, he must be at the lowest wages, and generally of the most worthless kind. But the more common course is for the farmer to be his own overseer—and as there are but few who labor regularly themselves, or who do not withdraw a large portion of the time from the actual superintendence of their slaves, (who only work when compelled,) there will necessarily follow the loss of much labor and product to the farmer, and be much consequent diminution of the public wealth. To pursue the parallel, the small farmer loses a horse, or his best slave—and as he has no means of supplying the deficient labor for a considerable time, to the first loss there is generally added another, equal to a third or half of his growing crop, for want of the labor so lost.

The large and the small farm are alike burdened by the erection and repairs of a dwelling house, barn, stable, &c. for each: and though these buildings will be more costly on the large than on the small farm, still the latter is far more heavily taxed in this way, in proportion to the income or capital. If the total necessary expenditure for buildings on the large farm (1000 acres) be $4000, the small one (of 100 acres) will certainly need $1000, which is more than double a proportional amount.

Finally—wealth is not always (nor indeed often) accompanied by education, intelligence, and public spirit—nor does poverty always banish these qualities and their valuable effects. But yet no one can deny that every benefit from these sources that has served to improve the state of agriculture, has been owing to the occupiers of large farms. Examine the history of agriculture as far as it is known, and no considerable improvement has ever been introduced by the small farmer.

The full consideration of this subject leads irresistibly to the conclusion, that large farms, (not too extensive for one man to superintend, or for the advantageous employment of the requisite labor,) are the most conducive to both the profit of the owners, and the public wealth. But however true may be the general proposition, God forbid that some future political Procrustes should have the inclination and power to put it into practical operation, by throwing our small farms into large ones, as effectually as the statute for the equal distribution of lands serves to cut up both large and small farms into still smaller divisions. The enormous losses that this policy has already produced to agriculture, and to the commonwealth, cannot be remedied nor lessened—and it is equally vain to hope for any cessation to the same disastrous course. If our landmarks could henceforth remain permanent, or be altered only when both public and private benefit would be promoted by the change, then the existing divisions would serve to produce all the benefits from large, as well as from small farms. But the course we have pursued, and still continue to pursue, seems to fix upon ourselves all the evils of the worst planned divisions of land, with the additional and still greater evil of endless change.

Let me repeat, that I am not treating of the equal distribution of land among the former owner's children, as a measure of state, but only as it affects the interests of agriculture. If the establishment of this policy was necessary to secure our freedom and political rights, then was that object wisely purchased by almost any sacrifice of pecuniary interest. But I confess that I view this dread of the ascendancy of the "landed aristocracy," as altogether unfounded—as the fear of a shadow, of which the substantial cause had never reached this country, and which was then almost expiring even in England. We have now left but few specimens of the nearly extinct "landed aristocracy" of Virginia, which serve to show how powerless men may be, although possessed of 5 or 10,000 acres of land. These gentlemen, on the average, are neither more nor less estimable than their poorer neighbors of equal intelligence: yet so completely are they disfranchised by their wealth, that I doubt whether any one of them could exert as much electioneering influence as some constable of the same county, or could successfully compete for public office with any respectable deputy sheriff.

If government did not interfere with the accumulation and distribution of land, and array our prejudices and feelings in support of its policy, the matter might safely be left to be decided by men's sense of self-interest. But government itself, has has been the great disturber of our landmarks—and in Virginia, the means that are acting to produce this effect, and all the incalculable consequent losses, is the total repeal of the statute of entails, and the substituted legal policy of equal distribution of land among the heirs of intestates.

The proprietor of every farm, whatever may be its size, throughout his whole occupancy is directing his labor and improvements to render his land convenient and profitable according to its then boundaries and extent. He considers that a certain portion of it should be arable, and perhaps he is for 40 years gradually clearing woodland to attain that object—and this arable land will most probably be in one compact body, and on one side of the farm, because such is usually the most convenient plan. Another portion of suitable size is left in wood, to supply fuel, and timber for fencing. The dwelling house is suited to the degree of wealth and the wants of the family of the farmer—and his farm-houses, to the amount of his crops and live stock. All these arrangements we will suppose completed, when the owner dies intestate, and the law divides his well arranged farm among five or six children. The commissioners appointed to make the division, may use the utmost care to guard the interests of all the heirs, and yet, (if there are minors among them,) they will scarcely avoid a loss of property equal to one-fourth of all the land. All the buildings being contiguous, they will seldom fail to fall within a single share: and though buildings in such cases are never valued at half their worth, (on account of their new owner's situation,) still even at that low estimate, that share receives so much in buildings, that it must have but little in land. The new owner will possess houses numerous and extensive enough for a farm of 600 acres, while his whole possession amounts to 40, without timber or fuel, and which cannot rent for enough to keep his houses in repair. Of course they go to decay, and the greater part of their value is an entire loss to the owner, and to the country.

The next share, or perhaps two of them, may include part arable and part woodland. The owner of such a share may be deemed fortunate, as it *may* be kept and cultivated as a farm, though under great disadvantage, as soon as the owner shall have erected suitable buildings, and made new fences. This expense, however, is another total loss or diminution of the value of the property, caused solely by the previous division.

Another share may probably be altogether of cleared land, without any materials for fencing or fuel—and the remaining ones altogether of woodland, which the owners' whole lives would not enable them to clear, and put into order as distinct farms. Neither of these shares would be worth even half their former value to the new owners.

Divisions producing losses of this kind are of every day occurrence, though under every variety of circumstances. Fewer heirs, or a different situation of the farm, may diminish the loss—more heirs, or a widow's dower right, may greatly increase it. But it is scarcely possible for any cultivated farm, (not of too great extent before,) to be divided into even as few as two shares, merely because it has two owners, without a considerable and permanent loss being incurred—and a public as well as a private sacrifice of property made.

But, it may be objected, that these heirs may sell their shares of land, and thus avoid the losses that would follow the retaining the property. It is true that they may sell, and the necessity of the case often compels a sale of the separate shares—but at what a sacrifice! If any of the heirs are minors, or if the widow lives and holds her dower right, no agreement can possibly be made for a general sale of the whole farm, which is the only way in which its former value can be preserved. In most cases, the sales are necessarily made separately, and for no greater sum than each share is worth to the particular heir, holding it alone. Nor can it be worth much more to the buyer, who is usually some neighboring farmer, whose other land only enables him to draw some income from a possession which was almost worthless to the unfortunate heir. He who is adding to his possessions by purchasing from time to time the inheritances of others, is also subject to great inconvenience and loss, in thus making a large farm by a patchwork of smaller pieces. To suit his new purchases to his own general plan, he has to clear woodland in one place, and let arable go waste in another—to pull down, or leave to rot, a building in one remote corner, while he is obliged to erect others in more convenient situations. If, in such cases the purchaser really gained *all the value* which the seller lost in his land, the public wealth would not be a whit diminished: but in truth, the difference in value, caused by dividing a farm, is totally lost to both buyer and seller—to the individuals concerned, and to the nation at large. The purchaser may afterwards so improve his newly acquired land as to make it worth more than before it was taken from the original farm: but if so, this new value will be entirely the fruit of his own industry and capital, and does not restore the former loss by division, which is gone forever.

Such divisions of farms must be expected to take place almost as often as the death of their owners occur; and each division probably causes an average irretrievable loss of value of 20 per cent. on each farm. The more that farms are reduced in size by this policy, the more heavy these losses must become—for large farms can be divided at a much less sacrifice of value than small ones. If we count the average loss from such divisions at one fifth of the value of the land, and suppose the average interval of 100 years before it will be necessarily repeated, (and this is moderate enough,) it amounts to the utter destruction of one fifth of the value of all our lands once in 100 years: aye—a destruction as complete and effectual as if one fifth of Eastern Virginia was swallowed by an earthquake. Is not this enormous, continual, and increasing drain from our private and public wealth, a cause sufficient of itself for the manifest decline of our country?

Besides the loss of capital which has been caused by our *patchwork* policy—(this regular system of cutting up farms, and then uniting the ill-assorted fragments into other farms, only to be cut up also in their turn—) there have been other consequences, not less deplorable.

The first is, that almost no improvement of the soil has been made, nor can half as much be expected in future, as would take place under other circumstances. Every farmer is either the owner of an ill-cut slice of some former farm, or he has made a large farm by patching together the detached fragments of several others: and in either case his main impovement, for a large portion of his life, must necessarily consist in laboriously *undoing* the improvements which were as laboriously made by his predecessors.

Secondly—every costly mansion, and even most good farm houses, become nearly useless after the death of the first owner; and consequently we are contriving to lower the scale of usefulness, as well as of cost, of all buildings in the country. Arab tents are inded better suited to our patchwork land policy, than substantial houses of brick or stone. Neither can we, with any expectation of profit, resort to the use of live hedges, or other durable and costly fences, as they would soon be rendered useless by the death of the owner, and by the consequent new dividing lines rendering new sites for fences necessary.

Thirdly—there have been very few farmers' sons well educated, since this impoverishing system has been in full operation—and the political influence and dignity of Virginia have sunk with the intellectual cultivation of the class that formerly upheld both.

It is true that when the shares of land that would be made by a division are so small and worthless that it is impossible for any one to draw a support from their cultivation, the law permits a general sale, provided that all the parties, and the next friends of minors, will concur in certain legal formalities, which seem to have been contrived for the benefit of lawyers, full as much as for that of the heirs. The trouble and cost of this proceeding amount to no small tax, and such cases scarcely deserve mentioning as very partial exceptions to the patchwork system.

The law forbidding entails and destroying the former right of primogeniture, certainly does not *compel* equal divisions of land; as every man may, by his will, keep his farm together, by giving it to one only his children. But the law forbids his continuing a like disposition of his land through future successions, which alone would effect a permanent benefit; and there is no inducement whatever for a father to make such distinction between children equally dear to him. The law has stamped with reprobation all such unequal bequests, though they are not absolutely forbidden: and under present circumstances, a father will best satisfy his children's expectations by dividing his farm among them, though at a sacrifice of one-fifth of its value. It would be both unjust and inexcusable, now, for a father to give all his land to one child, while to others were left legacies of much less value. But if the settled law of the land had so fixed the succession, there would have been no unjustice committed, nor complained of. The succession to property, in any manner whatever, is the creature of social institutions—and it ought to be so directed as will be most beneficial to both private and national interests. The popular arguments urged against the justice of entails, might be as correctly applied to prove the injustice of the rights to private property altogether, and of every institution of society, which enables one man to possess lands and moveable goods, while his equally meritorious neighbor is destitute of both. Yet every one who is above the grade of a grog-shop orator knows that the institution of the right of property is of inestimable benefit even to the most destitute class of every country.

The extension of the entail system in Europe has been a great public evil—and has served to obstruct the national welfare, as much as our totally opposite policy promises for ourselves. The permanency of landed possessions, and the facility of dividing and alienating them, are both to be commended so far as each course may produce public benefit—and either should be opposed when likely to cause injury to the commonwealth. An entail system that could serve to prevent both such accumulations and divisions of land as were manifestly unprofitable and injurious, and which would not prevent such divisions and alienations of entire farms, as the public interest might require, would prove of the greatest benefit to agriculture. Such a system would secure the object that I have endeavored to advocate, the permanency of the boundaries and existing value of farms, both great and small. The permanency of the succession in a particular family, is comparatively an unimportant consideration; and only worth the statesman's attention so far, as the expectation of that continued succession may prompt to greater individual exertion, and consequently, produce the greater ultimate benefit to the nation.

The statesman is wretchedly short-sighted who does not aim to direct the institutions of his country so as to receive support and strength from the folly and vices, as well of from the wisdom and virtues of mankind. Wisdom will thus derive support for the general welfare, from some of man's basest propensities—while ignorance will use his noblest qualities for the purpose of doing harm. Every individual is more or less influenced by avarice, or by a taste for prodigality; and both these evil dispositions may be exercised for the public good, under the entail system. Is the landholder a niggardly miser? So much the more will he value the permanent nature of his entailed land—and judging his posterity by himself, he will not suppose it possible that they will ever lose possession of the property. His most secure hoard will be the surface of his farm: his savings will be vested in durable fixtures and buildings, as being more safe than bonds and mortgages: and however small may be the early or annual income from such investments, still it will be so much clear gain to his posterity and to the nation. The beneficial effects thus produced by the operations of avarice, would compare with the admirable labors and valuable products of the religious community of Shakers. In that singular society religious fanaticism and discipline counteract the usual tendency of property held in common—the corporate nature of the society, produces the same consequences as would the entail of their land—and the prosperity and wealth of the society, show the wonderful accumulation derived from their system of wasting neither time nor labor, and putting every surplus product to some immediate and productive use.

But suppose the landholder to be a spendthrift. Even in that case, his vice may be beneficially directed. The tenure of his property will probably induce him to erect magnificient buildings, or to form costly pleasure grounds and gardens filled with choice fruits and rare plants. Or perhaps he will undertake some visionary and costly improvement, which though a cause of loss and perhaps ruin to himself individually, will remain of permanent value to the country. These channels of prodigality under existing circumstances are seldom used: for even a spendthift's calculations must show him that such expensive plans would not answer on lands which are so soon to be divided, and to pass thus divided into the possession of different strangers. To such a vent for prodigality and ostentation the civilized world owes the erection of piles of architecture in Europe, that will be admired for many centuries. If the noble canal which England owes to the enterprise and lavish expenditure of the Duke of Bridgewater, had proved an entire failure as to yielding profit—that is, if the expense had been so great that all the tolls on the canal, when completed were required to pay the the interest of its cost—then the whole cost of the work would have been lost to the constructor, and also to the general capital. But if, notwithstanding that the enormous cost of the canal had destroyed all hope of its yielding any profit to the undertaker, it still served as greatly as it has done to benefit trade, and to induce the construction of other valuable public works, better planned and more economically executed, then England would have been indirectly greatly benefited by the prodigality that had (according to our supposition) caused the Duke of Bridgewater's impoverishment. Without the existence of entails, men will certainly be not less disposed to indulge in lavish and ruinous expenditure: but their waste will be on costly entertainments, and ostentatious hospitality—the luxuries and fopperies of dress and of equipage—in hunting, racing, and gaming—and all other such transient and unproductive pleasures, which leave behind no monument of their having existed—except in ruined estates and impoverished heirs.

Under the operation of our existing policy the owner of a farm is discouraged from making any improvement of a nature that will have its value destroyed, or materially impaired, by the inevitable division of the land. The consideration that in a few years probably his farm will be cut up, and the value of his labors partially or totally destroyed, must affect all his important plans. But on an entailed farm, whether it contain 50 or 2000 acres, his judgment and feelings would concur in prompting a different course, and the one most advantageous to his country as well as to his successors. He would use no merely temporary expedients. His improvements and the arrangement of his farm would be intended to serve for ages to come. The durable fertilization of waste or barren fields, the erection of the most substantial structures, the planting of live hedges, fruit and timber trees, would be intended not only for his own benefit, but for that of his latest posterity. He would be both stimulated to act, and rewarded for it, by the belief that his works would last, and his name be remembered with gratitude and honor, for ages after his body had become dust.

CONSERVATOR.

For the Farmers' Register.

BELLS ON SHEEP SAVE THEM FROM DOGS.

Amelia County, December 12, 1836.

On looking around our homes on the various animals which man has domesticated and applied to his profit or pleasure, we should find great difficulty in dismissing any one from our service.

All, in their symmetrical relation and dependence, seem necessary to the circle. If called on to relinquish one, its value, like that of departed relations, friends and neighbors, would only then be justly appreciated.

Some could certainly be surrendered with less inconvenience than others; but should the sheep be demanded, what would be our alarm? The loss of our commerce, or the subversion of our institutions, would scarcely be greater evils. Yet how shamefully is this meek and defenceless friend of our race, neglected in our country?

Time, the mitigator in other cases of loss, could not bend us in accommodation to the circumstance. No other animal yielding a similar fibre, so necessary to our comfort and protection, affords it in such quantity, or is so much of the cosmopolite. In some climates, the fleece might probably be substituted; but several regions, now the abode of civilized man, would become depopulated.

It is probable our first parents levied their earliest contributions on this interesting animal, after their expulsion from the abode of innocent delights first assigned them. In the discord of elements and animals following the transgression, naked, shivering man stood exposed to the first, and our timid defenceless favorite, to the latter—each dependant on the other for protection. Hence, probably, in sacred writings, the useful and innocent lamb is made typical of the sure and only hope of the Christian, and the golden fleece among the meeds of highest achievements in profane story.

The superiority of one kind over another, is not intended to be discussed. The variety of the species is sufficiently great to meet our varied objects. Nor will the best method of rearing and keeping be detailed: ignorance on both branches forbids the undertaking. But, humanity, gratitude and justice, demand that they be fed, sheltered and defended against the lacerations and tortures of the midnight marauders, both biped and quadruped—

the last being the particular object of this communication.

For two years after it became my object to raise a flock equal to our domestic demand for wool, my stock rather diminished than increased, notwithstanding additions by purchases. This was ascertained to be the effect of nocturnal plundering, or rather murderings. Never till then did the atrocity of "sheep stealing" come home to my business and bosom. As my homestead is on the line of separation between the cultivated fields and the standing pasture, and the flock could seek protection near the houses, it was surprising this destruction could go on without detection in the act. Some of the culprits, however, fell under suspicion, and observation taught me they were shy, shrinking from observation, easily alarmed, and in pursuit, as voiceless as their victims. The conclusion was, that any noise might alarm the prowler, and drive him from his purpose. Bells put in motion by the flight of the flock, would probably draw attention. With this view, bells of the largest size suitable to the size of the animal, up to the highest tone audible at some hundreds of yards, were procured and fastened about the necks of every sixth or eighth sheep, by means of strong leathern collars. Nearly five years have elapsed, and up to this time, not one has been lost from this cause.

A neighbor who could not keep a flock before, purchased a new stock, and adopted the same expedient, and has since suffered no loss, at the last report.

To the lovers of good clothing as well as those of good mutton and music, a flock thus equipped, sending forth the agreeable chime as they pour along to the welcome salt, or file off to the field or fold, is no uninteresting spectacle.

This expedient may be no novelty—may be an old thing, neglected for its frivolity. Yet the rationality of the plan, so usefully sustained by experiment, is deemed worthy the sanction of my proper name.

THOS. MEAUX.

DOUBTS OF THE VALUE OF SOME OF THE OPINIONS NOW CURRENT ON AGRICULTURAL IMPROVEMENTS.

To the Editor of the Farmers' Register.

——— ———, *December* 16, 1836.

Sir,—In a desultory course of reading, I remember a long time since, to have met with a passage, in regard, I think, to Socrates, or if not him, some other of the sages of Greece, who being appealed to by his disciples on a disputation between them about "*the sovereign good*," (for in those days they had their favorite abstractions as we have ours,) answered their inquiry by another, "*good for what?*" Though I do not remember in what book I met with the passage, it has often occurred to me as applicable to a multitude of controversies that are carried on in our time, each of the disputants contending for some abstract doctrine, which in itself, is neither right nor wrong, true nor false, but may be the one or the other, according to circumstances. It would be an improper use of your columns, to illustrate this position by examples taken from other pursuits, but it may not be amiss to give some relating to husbandry, and I think, the question of Socrates, "good for what?" not inapplicable to several of your correspondents, who have recommended different applications of agricultural skill and labor, because they have succeeded in other countries, or with particular individuals here, or have taken sides as to the preference of one mode of husbandry to another, not with reference to circumstances, but in the abstract. I could refer to a large number of instances among the communications published in your Register, but will mention only a few; perhaps, you and your readers may justly think them more than enough.

The culture of silk was a favorite object of attention in Virginia, Georgia, and other parts of our country, at a very early period. The project seems to have been lost sight of for very many years, until lately, when it has been revived with increased ardor, to the north as well as the south, and has occupied no inconsiderable space in your columns. In the numerous publications on the subject that I have looked over, I do not remember to have met with one word of discouragement. I should not feel disposed, were it in my power, to discourage it altogether; but all will agree, that the difficulties attending it, if any, should be fairly stated, and that those who engage in it, should be enabled to act "*understandingly.*"

Having paid some attention to this matter, I will give you the result of my inquiries, and certainly have no wish that my opinions should pass for more than they may be found to be worth.

From all that I have been able to learn, the silk culture has never been carried on extensively and with success in climates where the cold of winter is long or severe, or in countries that are not well peopled. In China, the breeding of silk worms, and the manufacture of silk, have been carried on for thousands of years, and at this time, employ a considerable part of the crowded population of that immense empire. It has long since been observed, and I believe, is undoubtedly true, that no two distinct countries, in the same parallels of latitude, resemble each other more in climate, than China and the United States. In turning over the pages of Staunton, Barrow, and other travellers in China, I was struck with the circumstance, that in going from north to south, they did not find the cotton plant an object of cultivation, till they came to about latitude 38, and then only on a small scale, till they had gone some distance further south; shewing a striking coincidence, in this respect, between that climate and ours. The culture of silk, does not seem to have extended so far to the north, by several degrees of latitude. In France, from all I can learn, and I have taken some pains in the inquiry, it is not extended further north than the banks of the Loire, though it has been attempted in Normandy, and other more northern parts of that country. In Italy, it is carried on as well in the extensive valley of the Po, as south of the Appenines; but this fertile region is fenced from wintry blasts by the lofty ramparts of the Alps, for its whole length from east to west, and its climate is much more temperate in winter than ours, and the length of summer greater.

If a mild temperature were the only requisite to preserve the life of the worm, this object might be attained by artificial means, and with due attention, the proper warmth of the apartment in which they were hatched, might be maintained through the cold season, at the proper point, though not without much care and cost; but the worm cannot exist without food as well as warmth, and a constant supply of green leaves is absolutely necessary for its sustenance. Although attempts have been made to substitute other vegetables, I believe none have been found to succeed on a large scale but the mulberry; some varieties of which are said to be much preferable to others. The mulberry being a deciduous tree, can afford no supply of food during the cold season, as indeed, is the case with all other trees or plants, that have been recommended as substitutes. It is true, that the insect while in the egg, or in the chrysalis state, does not consume any, and it may be possible to preserve the eggs unhatched during the winter in a northern climate, and indeed, it must be so to a certain degree, or the culture of silk would fail entirely in Connecticut. But on the other hand, its want of success in a sufficient degree to make it an object in the south of Germany, the climate of which is not much colder than ours—in England, where it is milder, and this with the advantage of direct encouragement from the public authorities, by high premiums, &c. and in the more northern part of France, while it succeeds further south—leads to a strong, I may say a necessary presumption, that silk cannot be produced as a general object of cultivation in the northern states, or even so far north as Virginia. You will readily suppose that these views are not original. If they were, their value would be less. They are the result of information that I have collected from various respectable sources, and among others, from Young's *Travels in France*, a work of great and acknowledged merit, which is probably in your possession, or within your reach. If not, you may find it reprinted in Pinkerton's Voyages, &c. published by subscription in Philadelphia, about 1811, in six quarto volumes, of which there are many copies in the country. In chapter 23rd, "*Of the culture of silk in France*," Pinkinton, vol. 4, p. 569 to 580, are notes on the cultivation of silk in different localities, generally in the south of France. The whole might take up too much space in your Register, but if you can find room for the passage "*on Normandy*," in pages 571, 572, and for the latter part of the chapter beginning at page 577, "*Languedoc*," &c. both you and your readers will find a detail of it in facts, I doubt not, an accurate one, relating to this question, and a course of clear and forcible argument that will deserve your consideration, and I think, satisfy you, that silk can never become an object of general cultivation in Virginia. For myself, I am fully persuaded, that it would never answer on a large scale in our climate, even if the wages of labor were not so high as they now are, or are likely to be, for generations to come. Still, it is probable, that in one state of society, there are members of a large class of our population that might be employed in this way, without loss to the community, and with some advantage to themselves.

Throughout the continent of Europe, except some of the richer countries, such as Holland, a large proportion of the whole population is occupied in the culture of the soil. This is more or less the case in different parts of Ireland and Scotland, but not in England. On the other hand, great numbers of females are engaged in English manufactures. In this country, much field labor is performed by female slaves, but it is unknown to white females from north to south. The wonderfully rapid increase of our population, necessarily furnishes occupation to a great proportion of them, but there are many of the middling and poorer classes that want employment, while their male connections are laboriously engaged in providing the means of support for themselves and their families. It is true, that a number of families are employed in manufactories, but they bear a very small proportion to the whole, and we must take into account the comparative cheapness of manufactures produced by machinery, which has greatly diminished the amount of domestic manufactures, so that on the whole, there are not near so many females employed in this way as formerly.

It is neither to be expected nor desired, that the wives and daughters of our more independent classes of industrious men, who draw good incomes from their talents and application to business, should lead a life of toil; but if some new and useful employment suited to females in more limited circumstances, could be found for the numbers among them whose time is not taken up by domestic concerns, it would add much to their real comfort, and indeed, be a public benefit, greater, I think, in the northern states, but not to be disregarded in the southern. None occurs to me, at present, as being likely to answer this purpose better, than the culture of silk, though, I believe, the profit would be very moderate indeed—still it would be preferable to idleness. Occupation they must have, and the manufacture of domestic silks, is certainly better suited to them, than the wearing of foreign, in visits or excursions more or less expensive, far or near. It is but justice to add my belief, that it is not their fault that they cannot, at all times, find useful and suitable employment.

These remarks having been drawn out to a much greater length than I had thought of, when I began them, it might be better to stop here; but I will venture to add a few words on a topic which is thought a very important one, by many improving farmers throughout the United States—the improvement of our stock of cattle, by importations from the best English breeds. It certainly deserves attention, but is, perhaps, of less consequence in our southern grain and tobacco country, than further north, or among our mountains. Large sums have been expended in the importation of English cattle, and handsome profits have been realized by sales of their produce. The preference, I believe, has settled down in favor of the Durham short-horns; the bulls of that stock, commanding the highest prices in England. Much has been urged in their favor, in print and in conversation, and they are always mentioned as being emphatically a good breed; but the question, "*good for what?*" seems never to have occurred among us in regard to them. Most, if not all English writers on the subject speak highly of them, and among others, the last and probably the best work, the *Treatise on Cattle*, published under the direction of the Society for the diffusion of Useful Knowledge—but never in the abstract. They seem not to have gained a footing in the highlands of Scotland, the mountains of Wales, or the less fertile lands of these countries, nor indeed of England. On fertile soils, where cattle are reared as well as fattened for beef, I believe they are pretty generally preferred; but the very extensive rich pastures that are devoted to the fattening of cattle only, are most commonly stocked by smaller and cheaper breeds drawn from Scotland, Wales, and those districts in England, where the pastures being thinner, are better adapted to breeding, than fattening.

The Durham short-horns grow to a large size in a short time, fatten kindly, and yield more milk than most other breeds, though it is admitted to be rather thin in quality; but the small proportion of bone to flesh, an advantage with the butcher, renders them too heavy and inactive for the yoke. I have heard it asserted that they thrive on our pastures, but think this must be a mistake. Like other animals, they must require food in proportion to their bulk, and a large short-horned ox or cow, toiling through a hot day, over a wide extent of thin pasture grounds, for a scanty supply of indifferent grass, would sadly disappoint any sanguine expectations from them. To pasture them on the single crop of clover admitted into our scourging rotation of grain crops in rapid succession, would be contrary to one of our canons of agriculture, and I believe, you and your correspondents will generally agree, would within a short period, reduce a soil not highly fertile to a *caput mortuum*.

Experience and observation have long since shown, that the native breed of cattle in every country, are accommodated *in size*, to the climate and supply of food. Those of our lower country, though very small, are often remarkably well formed; and by careful selection, and a better supply of food, in winter as well as summer, we might in time obtain a native breed, little, if at all inferior for our purposes, to any we could get from Europe. You will not understand me as objecting wholly to this favorite English race. In various parts of the United States there are rich pastures to which they may be very well suited, and even among us, a slight infusion of blood from cattle so handsomely formed, might add something to the beauty of our stock, and at all events, lead us into the habit of bestowing on them, and by degrees on our native breed, more care and attention than unfortunately it receives from us at present.

Permit me to add a "*few more last words*," on the question, "good for what?" as applicable to a very important object of our husbandry. The four-shift rotation, of two crops of wheat, a crop of corn, and one of clover, in four years, has not only been recommended by the example of some of our most successful cultivators of rich soils, but is proposed as a model for general imitation. With good cultivation, and good management of manures, &c. it may succeed on such lands—but if applied through the whole, or even the greater part of our wheat lands of a medium quality, both the crops and soil would be in a rapid course of decline. Indeed, I am by no means sure that this process is not going on at this time, on a very large proportion of our wheat soils. That this grain is generally put in, harvested, and prepared for market, better than formerly, I have no doubt, and I think it equally clear, that plaster and clover with proper management, tend much to the improvement of soil; but I cannot conceive the possibility of keeping up by this means the fertility of land, not of the first quality, from which three exhausting crops of grain are taken in a four-years' rotation. These crops would reduce the soil faster than the clover and plaster could restore it, and it could only be kept in heart by good supplies of manure, which the land itself could not furnish. This system then, can only succeed in a general way, by setting apart a portion of the land for pasturage, and keeping as good a stock of cattle, as can well be maintained through the winter, and thus providing a good supply of manure. If marl or lime is within reach, the task is much easier: less animal manure will be necessary, though I have no idea that it could be wholly dispensed with, and a larger proportion of the land may be kept under the plough. My objection is not to the four-shift course in itself, but to the attempt, vain and visionary as it seems to me, to carry it on successfully, without plentiful supplies of manure. These can only be obtained by good stocks of cattle; and agreeing with the advocates of the system, that the arable lands should be subjected as little as possible to the tooth and the hoof, the necessity for separate pasture lands seems unquestionable. I do not enter into the question, whether the four-shift system, with these limitations, be preferable to any other: very probably it may, on lands of a good quality. On middling or inferior soils, it might answer by throwing out for pasture a part of the arable lands, and taking pasture grounds into the rotation from time to time; or if the pasture lands are not suited to the place, it might be best to keep the same lands always in rotation of arable crops, or in pasture. Neither the four-shift system nor any other plan of husbandry is good in the abstract. The question always recurs—"*good for what?*"

These remarks are freely submitted to your consideration and censure, and those of your readers. They are hastily made, though I have reflected maturely on the subjects to which they relate. If they draw no attention, I am content: and if they are thought worthy of any notice, I trust, that though they may not themselves convey any useful information, they may lead to it.

With my best wishes for continued success in your useful labors,

I am, respectfully, yours,

——— ———.

BENGAL INDIGO. REMARKS ON CALCAREOUS MANURES.

To the Editor of the Farmers' Register.

Burlington County, N. J., Dec. 15, 1836.

* * * * *

A friend of mine, who returned last year from India, where he has been engaged for a number of years in the cultivation of the indigo plant, and in its manufacture, has brought with him a large quantity of the seed of that valuable plant of the true Bengal species, and he desires me to say to you, that if any of your correspondents would take the trouble, the following season, to test the practicability of its culture in your climate, he will forward to you for distribution, to any port you will name, to which vessels sail from Philadelphia, a box of the seed containing about five bushels. He has several other boxes of similar contents, which he would send further south, if a disposition is shown to engage in the culture. His directions for the culture are very simple. It is usually sown broadcast, but it may, perhaps, be better cultivated in drills about two and a half feet apart, by those who would bestow a little extra pains. The proper time for sowing would be, in this country, about the usual time of planting corn. It will grow well on light sandy lands, that are suitable for the cultivation of rye. The ground may be rich, if it is intended for seed the first year, but for manufacturing into indigo, the stalks on rich ground contain too much gelatine, which is a serious detriment, both to the process of manufacturing, and to the quality of the article. In India, it furnishes two cuttings in the season; here, probably, but one could be raised. It is cut when about one-fourth of the blossoms have unfolded, and will require the same precautions in the curing, as clover hay, and in every respect, the same management. A simple extract from the green or dried plant, makes a very permanent dye, when set with alum; hence it may prove of value to those planters who manufacture any kind of clothing for their families. Mr. Haines, the gentleman alluded to, is so confident of its success, even in this latitude, (N. J.) that he intends to superintend the cultivation and manufacture of a considerable quantity the next season, and if he should succeed, hopes to be able to re-supply himself with seed from the south. He is firmly convinced, that with the means within the reach of southern planters, indigo may be made to rival any of their staple productions in value, particularly on lands which are too much exhausted for the cultivation of cotton or tobacco. His choice of land here is the pine region, which I suppose to be very similar to that of the south.

Accept my sincere thanks for the copy of your invaluable "Essay on Calcareous Manures." It has been my text book in my farming operations since I first met with it. We have been using marl (green sand) here for many years, and lime very freely for the last ten years; but I must freely acknowledge that I have been working in the dark until I adopted your excellent theory, as the basis of my operations with those valuable materials—and yet my library is not deficient in standard agricultural works and periodicals. In looking over your third volume, a few days ago, I was induced to make the following entry in my note book. You will do me a great favor by replying to it in the Register, as soon as convenient. "I observe in some remarks appended to an article from Sinclair's Code of Agriculture on 'Bones as a manure, and on the use of sea shells, shell marl, and coral, for the same beneficial purposes;' in the third volume of Ruffin's Farmers' Register, at page 600, the editor objects to the author's ascribing equal virtues to pounded oyster shells as to pounded bones, as a manure, and gives as a reason that oyster shells are entirely composed of carbonate of lime, except a *very small* portion of gelatinous animal matter. Now, I should like to know, from the worthy editor, how he reconciles this opinion with his experiment on fresh water muscle shells, dissolved in a weak mixture of muriatic acid and water, (Essay on Calcareous Manures, pages 30 and 31,) or whether the experiment will not show the same result with oyster shells—for on the strength of this experiment, without having heard of ground oyster shells having been used, (though I have since read of Mr. Coke's and other experiments,) I had determined to erect a mill for breaking them by horse-power, after the manner of the old fashioned bark-mills, used by the tanners."

[For want of space and time, in closing this No., we must postpone for the next publication, the remarks which the foregoing letter calls for.]

From the Columbia (S. C.) Telescope.

TRIBUTE TO THE NORTH.

By Senator Preston.

Mr. Preston, in his speech concerning the rail road, on Monday last, drew a very striking contrast between the difference of character of the people of the northern and southern parts of the Union, and the consequently opposite condition of the countries that they inhabit.

He said, that no southern man can journey (as he had lately done,) through the northern states, and witness the prosperity, the industry, the public spirit, which they exhibit—the sedulous cultivation of all those arts by which life is rendered comfortable and respectable—without feelings of deep sadness and shame, as he remembers his own neglected and desolate home. There, no dwelling is to be seen abandoned, no farm uncultivated, no man idle, no waterfall, even, unemployed. Every person and every thing performs a part towards the grand result, and the whole land is covered with fertile fields, with manufactures, and canals, and rail roads, and public edifices, and towns and cities. Along the route of the great New York Canal, (that glorious monument of the glorious memory of De Witt Clinton) a canal, a rail road, and a turnpike, are to be seen in the width of perhaps a hundred yards, each of them crowded with travel, or overflowing with commerce. Thoughout their course, lands that before their construction would scarcely command five dollars the acre, now sell for fifty, seventy-five, or a hundred. Passing along it, you see no space of three miles without a town or village, and you are never out the sound of the church bell.

We of the south are mistaken in the character of these people, when we think of them only as pedlers in horn flints and bark nutmegs. Their energy and enterprise are directed to all objects, great and small, within their reach. At the fall of a scanty rivulet they set up their little manufactory of wooden buttons and combs—they plant a barren hill-side with broom corn, and make it into brooms at the bottom—and on its top they erect a windmill. Thus at a single stop you may see the air, the earth and the water, all working for them. But at the same time the ocean is whitened to its extremities with the sails of their ships, and the land is covered with their works of art and usefulness.

Massachusetts is perhaps the most flourishing of the northern states. Yet of natural productions she exports but two articles—granite and ice. Absolutely nothing but *rock and ice!* Every thing else of her commerce, from which she derives so much, is artificial—the work of her own hands.

All this is done, in a region with a bleak climate and steril soil, by the energy and intelligence of the people. Each man knows the public good is his individual advantage. The number of rail roads and other modes of expeditious intercommunication, knits the whole country into a closely compacted mass, through which the productions of commerce and of the press, the comforts of life, and the means of knowledge, are universally diffused; while the close intercourse of travel and business makes all men neighbors, and promotes common interest and common sympathy. In a community thus connected, a single flash of thought pervades the whole and, almost as rapidly as thought itself can fly. The population becomes as it were, a single set of muscles, animated by one heart, and directed by a common sensorium.

How different the condition of things in the south! Here the face of the country wears the aspect of premature old age and decay. No improvement is seen going on—nothing is done for posterity—no man thinks of any thing beyond the present moment. Our lands are yearly tasked to their utmost capacity of production, and when exhausted, are abandoned for the youthful west. Because Nature has been prodigal to us, we seem to think it unnecessary to do any thing for ourselves. The industry and skill that have converted the inclement and barren hills of New England into a garden, in the genial climate and fertile soil of the south would create almost a paradise. Our natural advantages are among the greatest with which Providence has blessed mankind, but we lack the spirit to enjoy and improve them. The rich ore is beneath our feet, yet we dig not for it. The golden fruit hangs from the bough, and we lift not our hands to gather it. The cask of delicious liquor is before our eyes, but we are too lazy even to broach it. In thinking, in writing, and in talking, we are equal to any people on the face of the earth—but we do nothing but think, write and talk.

From the Southern Agriculturist.

ON THE MANAGEMENT OF NEGROES, &C.

[Concluded from page 495.]

Having laid down some rules for preserving cleanliness among negroes, and attending to their diet, I proceed next, to the regulation of their morals and habits.

As soon as the negro is convinced that cleanliness adds to his comfort and ease, at home, he will unconciously practice the same, in discharging all his master's work. The slave, who has his head combed, and his face washed, and his clothes cleaned, will seldom be found neglecting his work in the field, or scratching his head, as is too often the case, when he should be at his task. Niceness and exactness in discharging his duties, will imperceptibly creep into all his habits.

Order.

To observe order in all things, is a precept of Solomon; and the planter who will cause his negroes to adhere to this wise admonition, will live an easy and agreeable life throughout the year. I have seen a certain planter, who always has his negroes at work: they are never idle; and yet, he is always behind the seasons. Now, this arises from the non-observance of order. If he would only cause his negroes to do every thing as the time, the place, and the circumstance demanded, every thing would be done right, and he would get along well. Preserve order yourself, in all your actions, and your negroes will imitate you. For instance, if you ride by a fence that has been broken down, and you have a boy with you, make him stop and repair it; if you have no boy, get down, and do it yourself. Let every negro about you, and on your plantation, be made to observe this. I make it an offence, severely punishable, for any of my slaves to pass by any thing out of repair, without either stopping to put it to rights, or informing the proper person whose business it is to do so. One rail supplied, when the fence demands it, will save a supply of perhaps twenty or thirty, a week afterwards. I have seen negroes pass over bridges which had great holes in them, fifty times, and never take the trouble to mend them, when one log of wood could easily have done so. If negroes of mine did the like, be they male or female, if they were old enough to have discretion, I would punish them for the negligence. Let it not be said that such exactness is severe. Practice makes such things easy to the slaves, and they find it much better for their own comfort in the long run. The master should make it his business to show his slaves, that the advancement of his individual interest, is at the same time an advancement of theirs. Once they feel this, it will require but little compulsion to make them act as becomes them.

Morals.

The planter should endeavor, as much as possible, to make his negroes adhere to moral rules. I know that to lay down any general code for them is idle. But then, a few particular rules may be strictly attended to. Among these, I particularly enjoin upon my slaves, the observance of their marriage contracts. In no instance do I suffer any of them to violate these ties—except where I would consider myself justified in doing so. Independently of the excellence of such an institution itself, it has the additional advantage of keeping your negres at home.

If there be a church in the vicinity of the planter's residence, he should oblige all of his negroes to attend it, at least once a day. This has an excellent effect. Most negroes take Sunday as their day of visiting; and it not unfrequently happens, that they do more mischief on that day, by colleagueing themselves, than on any other. Now, the attendance upon church permits them to meet their relatives and friends there, and. at the same time, keeps them out of all mischief. It is rarely that any one can attend a house of religious worship without gaining some wholesome information. And the slave will generally learn, at such places, the reasons which sanction the master to exact of him his respective duties.

Upon their return from church, I generally employ them in regaling themselves in different healthful and innocent amusements—such as will tend to keep them in good spirits with each other. I know that some persons will object to this, as a desecration of the sabbath; but, for my own part, I cannot be persuaded that God's holy laws are violated in the innocent recreations of his creatures. But no more of this at present.

I have now, Mr. Editor, concluded my notions upon the management of negroes. I feel that I have said far less than the importance of the subject demands: but I hope that the little I have said, and the very imperfect manner in which it has been said, may induce others to give their notions likewise. We live by example, and, let me add, that much which is borrowed in this way, is immensely valuable. That every planter may recollect this, and that we may all do more than we have done, is the earnest wish of

A PLANTER.

For the Farmers' Register.

COMMERCIAL REPORT.

The extreme punctuality with which your Register is issued, caused my last communication to be too late for your December number; and as what it contained applies in some degree to the present state of affairs, a part of it may be embraced in the present report.

The cry of "scarcity of money," which has resounded for several months at New York, is now heard in almost every direction throughout this country, and is even echoed back from England. The commercial relations which exist between the two countries, are so intimate and extensive, that whatever affects the one, is soon felt by the other. The change made by us in the relative value of gold and silver, causing importations of the former, has created an alarm in England, and induced counteracting measures on the part of her monied institutions. The high rates of interest current in New York, (1½ to 2½ per cent. per month,) tended to attract capital from other quarters. Large amounts of American stocks were sent to Europe for sale, and the great demand for money on American bills, &c. created some alarm in London, where the rate of interest advanced from 3 per cent. per annum, to 5 and 6. The mere assertion, that money is scarce, tends to verify itself. Monied men are induced to withhold it, or to ask more for the use of it. I do not intend, however, to enter into any argument on the subject, but merely to state the fact, that a severe money pressure exists in the mercantile community generally, from which the commercial towns in Virginia are not exempt. The best paper cannot be readily discounted. Specie is drawn by one bank from another, and thus kept *in transit*, at an expense, but without benefit to either party. With a larger amount of specie in the country, than at any former period, there is less facility in the transaction of business, than heretofore.

Remittances cannot now be made from one part of the Union to another, unless at a great difference in exchange. As much as 3 or 4 per cent. exclusive of interest, being paid at New York, to negotiate bills on Virginia, and 5 to 6 per cent. on Mobile and New Orleans. Our internal exchanges are again totally deranged—the traveller from one part of the union to another, finds no currency which will pay his way throughout. Gold is not to be had, silver is too cumbrous, and local bank notes change their value according to distance, and to the tariffs of brokers.

Through the medium of foreign bills, a system of usury has been introduced in the larger cities, in which it is suspected that some banks, and even of those which are patronized by the government, participate. Bills on England, which are current at 8 or 9 per cent. premium, for cash, are sold at 12, 15, 18, even 20 per cent. on time, exclusive of interest—the same bills are probably thrown into market and sold at 8 or 9 per cent. for money.

The distribution of the enormous amount of surplus revenue, (to be taken from an accumulation of nearly fifty millions of dollars,) is looked to as a source of relief, a cessation of speculations in lands, in city lots, or in *cities to be founded*, will doubtless tend also to relax the pressure.

The preceding remarks were made last month, and although it is stated from high authority, that the rates at which internal exchanges have been negotiated, previously to the passage of the deposite act of last session, were generally below the rates charged during the existence of the United States' Bank, the experience of those who have had to make such negotiations, does not confirm this statement: on the contrary, it is well known to those who have had to transfer funds from one part of the union to another, that it has been attended with great difficulty, and sometimes considerable expense.

The causes of *existing* difficulties and derangements may be found in an exposition from another source highly intelligent and more experienced, than perhaps, any other, on the subject of financial arrangements and exchanges.

The crop of cotton in the United States is variously estimated at 1,500,000, 1,550,000, and even as high as 1,600,000 bales. Should the lowest number be realized, it is not reasonable to expect that present prices can be maintained. During the month of November, the price declined in Petersburg, from 17½ to 16 cents; and in the early part of this month, it was further reduced to 15½ for the best; but the planters having withheld their crops from market, a temporary advance to 16 cents was gradually attained. The demand has consequently abated, and a decline will probably ensue, unless the home demand shall require all that is brought to market. No advices have been received from Europe, later than 26th October, and shippers are entirely in the dark as to the state of markets there.

The low stage of the rivers in Alabama has prevented supplies reaching Mobile; but in the aggregate receipts at the various markets in the United States, there is already an increase of 50,000 bales, on those of December last.

Until within the last few weeks, the arrivals of grain from Europe were very considerable, but no statement has yet been published, to show the quantity. The profits to the importers were generally large; particularly on rye, which has been sold in some instances at four or five times the first cost in Germany or Russia. The quality of the grain is good, and the condition much better than could be expected, after being so long kept and subjected to repeated shipments. The ports from which the principal supplies are obtained will be closed by ice until the spring, and as it is thought that the wants of Europe will require all the grain which remains there, no decline in price can be expected in this country until after the next harvest. Wheat, of fair to good quality, commands $2 to $2 25 cts. per bushel—Flour, $10 to $12—Indian Corn, 75 to 80 cts.—Pork, $8½ to $9 per 100 lbs.

Tobacco declined very considerably last month, and sales of old were made at a reduced price of ⅓ to ½ on the prices which it commanded a few months previously. The sales in November, were at $2 to $6 50 or $7, embracing very inferior to good and fine. Although the new crop is supposed to be very abundant, yet the supply during the present month has been inadequate to the wants of our own manufacturers, (who prefer it to the old,) and the price has advanced. Lugs command $2 50 to $5, and leaf $5 50 to $6—but these prices do not include fine qualities, none being yet brought to market.

The value of all descriptions of stocks has been very variable in the northern cities, and generally low. In Virginia they have not been subject to similar fluctuations, and considering the scarcity of money, command good prices.

The line of rail roads in connection with those already completed, from Raleigh to the Potomac, are in rapid progress. One from Petersburg to City Point is about to be commenced, and exertions are making to commence one from Weldon and Gaston to Danville and Evansham, one from Petersburg towards Farmville and Lynchburg, and one from Richmond to Lynchburg; but it is not reasonable to expect that all these projects will succeed. Another very important one is proposed from Lynchburg to the Tennessee line. For the extensive operations of the James River and Kanawha Company, I can only refer to the official report lately published.

Applications are before the legislature for the establishment of several banks, the want of which, is annually the more felt in consequence of the large investment of capital in manufacturing establishments, and works of internal improvement.

Another large cotton mill, (the Ettricks,) has been erected in the vicinity of Petersburg. The stock for one other, (the Mechanics,) has been subscribed and a third is about to be undertaken—all within a short distance of the existing establishments. Extensive iron founderies and mechanic shops are also erected at Richmond and Petersburg, which will soon be in operation.

The enterprising citizens of Danville and Milton on the Roanoke are also erecting cotton mills, and several similar establishments have been and are about to be erected in North Carolina. So that in the course of a few years, nearly the whole crop of cotton in Virginia and North Carolina will be required by the mills in those states—a very desirable result for giving employment to our white population.

It is hoped that the culture of silk will soon be introduced as affording a useful and profitable occupation to the numerous hands, whose labor is now inefficient.

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PROPOSALS TO PUBLISH

THE REPOSITORY FOR HISTORICAL MATERIALS,

To consist principally of selections from old Virginian manuscripts.

THE private correspondence, and other papers, of the actors in, and observers of important public events, will always furnish matter of interest and instruction to those who may read them in later times. However hasty, imperfect, and partial or otherwise incorrect, may be the opinions thus given, they will furnish more historical truth, than would the most voluminous and elaborate public papers prepared by the same, or any other individuals. In the former class, we see precisely what the writers thought at the moment, or desired to impress on those whom they addressed—in the latter, we only find what they had maturely digested and what they wished the world should believe. Besides, in papers never designed for the public eye, there will be presented numerous minute touches that serve to make complete the picture of the period described, and which would not appear at all in writings in which a show of dignity was aimed to be preserved, or which were intended to meet the eyes of the world.

For these reasons, it is highly desirable that such papers and letters of the actors in our revolutionary war, as have not already been wasted and destroyed, and which are suitable for the object in view, should be gathered and preserved by being published—the only certain mode of preservation. Materials of this kind have been most abundant in Virginia—and it is believed that they are still numerous—though greatly and deplorably reduced by time, neglect, and by destruction of every kind. The lapse of time often gives a high value to, and invests with claims to our veneration, papers to which the writers themselves attached no value. These opinions are greatly strengthened by the examination of some such remains of old correspondence already obtained, and which has produced an ardent desire to save from destruction and oblivion all other now remaining memorials of former times, that deserve publication for their interest, and which by being published would not justly offend any person.

Though the neglect, waste, and wanton destruction of such memorials, for fifty years, has left in being but a small portion of the number and value formerly existing, yet these remains, like the Sybil's books, are thereby made more precious than the whole would formerly have been considered. And though the harvest is thus deplorably diminished, the gathering in of what remains, will be favored by the remoteness of the time it is attempted, from that in which the persons lived, whose acts and opinions may thus be brought in view. Many considerations would make improper, indecorous to the parties mentioned, and obtrusive on the public, the *early* publication of private papers, which would be free from all such objections, and be invested with much interest, half a century later.

Probably some of the descendants or heirs of all the prominent actors in the revolution, or in earlier times, still have some remains of their correspondence, or other papers that would throw light on the events of those times. Such papers, especially when few in number, are often little prized by their owners, and are rarely secured properly from injuries that must, sooner or later, cause their total destruction. But if a general depository is offered for the reception of such papers, with a view to their publication, it is probable that every one now holding such, will readily thus bestow them.

With these views, the undersigned proposes to collect and publish in periodical numbers, and for as many annual volumes as may be supplied by the materials furnished, the suitable remaining letters and papers of individuals who lived and wrote during the revolutionary war, or before that time. If the scheme is properly sustained, its success may induce the better care and preservation of later papers, and in them provide a far more complete supply of memorials of later times.

The undersigned would not have made this attempt if either the state of Virginia, or some well established literary association would have undertaken the work. It is properly a *public work*, and ought not to be left to private or individual enterprise, or risk. But seeing no probability of such a scheme being speedily (if at any time) carried through by either of these preferable modes, the undersigned has been induced to make the effort, and to incur the risk of the loss which will follow, if it should not be sustained by public favor. Should this proposal induce the offer of proper and efficient action by the state, the undersigned will readily surrender his personal interest in the scheme, and furnish his materials, and his aid, if required, for its prosecution under these far better auspices.

Neither would the attempt have been made so soon, and with so little preparation of materials, and consultation with their possessors, but for these considerations, which it is hoped will be a sufficient excuse. Every year—indeed every day that passes—lessens, by waste and destruction, the number and value of the papers yet remaining: and thus to propose a plan of publication, is the only easy and speedy mode of conferring with, and obtaining the consent and aid of the numerous unknown individuals who may have possession of these wasting remnants.

The support desired is not only in subscriptions to the publication, but in the more important matter of preserving, and furnishing every remaining fragment that may serve as proper materials for the work. Nor will the letters to or from persons of distinction only be valuable. The correspondence, or private memoranda, of many individuals unknown to fame, may furnish much matter that is interesting or instructive—and it is desirable to collect every thing that may appear likely to serve as materials for the work designed.

Nearly if not quite enough materials have already been obtained for several monthly numbers. The first sheet, as a specimen of the general manner and form of the work, will be speedily issued—and then before more risk is incurred, the publisher will wait to see the prospect of support to the plan, both in subscriptions and contributions of materials.

All persons who may possess any manuscripts, or fragments of unpublished papers, that seem at all suitable as materials for this work, are requested to send them to the publisher. If specially desired, the original manuscripts will be afterwards returned. Any limitations to publication that may be imposed by the donors, and particularly stated, will be carefully obeyed: and the most scrupulous delicacy will always be observed as to the introduction of any names of individuals that ought not to appear.

All those who may approve of the plan proposed, and consider it likely to be of public utility, are requested to aid its being carried into effect, by obtaining for the work either subscriptions or materials, and transmitting them to the publisher as soon as may be convenient.

Subscriptions and steady support to a work of this kind, (which, however valuable, will not be interesting to a numerous class of readers,) cannot be expected except from the most intelligent or public spirited portion of the community—forming, unfortunately, but a small proportion of the whole. On this account, as well as for the great labor, care, and expense that will be required to collect such materials, to select from the mass, and to decypher manuscripts in every stage of decay and obliteration, it will be necessary to have a higher price, compared to the amount of matter, than the cheap compilations and other periodicals of the present day. The great difference of circumstances, in these respects, will be manifest to every one.

THE REPOSITORY FOR HISTORICAL MATERIALS, will be published in pamphlet form, and in monthly numbers, of 48 pages each, large octavo, neatly covered. The first sheet of No. 1, will be soon issued (gratuitously) as a specimen of the manner, form and mechanical execution of the work. In all particulars not otherwise stated here, or exhibited in the specimen sheet, the form of publication, and the conditions, will be similar to that of the Farmers' Register.

The editor reserves to himself the privilege of varying the form of the publication, or making any change of plan that more mature reflection may show to be preferable, but not in any manner to lessen the amount of promised matter, or the value of the work.

EDMUND RUFFIN.

Office of the Farmers' Register, Petersburg, Va. Dec. 26, 1836.

PRICES CURRENT.--December 28, 1836.

PRICES OF STOCKS.	Par value.	Offered.	Asked.	Last sales.	Last dividend for 6 months.
BANK—Virginia—per share, - -	100			118	4½
Farmers', - - - - -	100			115	4
RAIL ROAD—Petersburg and Roanoke,	100		113	113	6
Portsmouth and Roanoke,	50			40	Unfinished
Chesterfield, ($53 of capital refunded,) - -	100		no sales		
Richmond & Fredericksburg,	100		110		Unfinished
Greensville & Roanoke, (both new and old stock.)	100		110	108	do.
Raleigh and Gaston, -	100		95	95	do.
Richmond and Petersburg,	100		100	100	do.
MANUFACTURING COMPANIES.					
Petersburg Cotton Manufactory, - -	100		125	125	8
Merchants' Do. old stock, -	100		150		12
Do Do. new stock, -	100	130			Unfinished
Matoaca Do. - - - - -	100		125		New
Do Do new stock, -	100	112			
Ettricks Do. - - - -	100			110	
INSURANCE COMPANIES.					
Petersburg, Fire and Marine, - -	100	106	107	106	9

EXCHANGE on England, - - - - 8¼ per cent.

COUNTRY PRODUCE.

Wheat, red, - - -	$1 50 to 2 10	Cotton, - - - - -	0 15 to 0 16
white, - - -	1 75 to 2 20	Tobacco, old, none in market.	$5 00 to 6 00
Flour, superfine (country,) new	10 00 to 10 50	Do new, for manufacturing.	4 50 to 6 50
City and family -	10 00 to 12 00	Do Do lugs.	2 00 to 4 00
Corn per bushel, (old) - -	0 75	Bacon (hog round) Virginia, new,	0 14 to 0 15
Do (new) -	0 75	Pork, fresh, - - - -	9 00

MINERALOGY.

THE school of Analytical Chemistry, Mineralogy, and Geology of the Mineralogical Society of Virginia, will go into operation on the 3d of December next, in the Philosophical Rooms of Hampden Sidney College. The meetings will be held every Saturday, at ten o'clock in the morning, during the four following months.—Fee $20.

The course will commence with instruction in some of those subsidiary arts, without which, the operations of microscopic chemistry cannot well be carried on; the manufacture of small glass utensils, and the use of the blowpipe being here introduced. *Qualitative* analysis, or the detection of the ingredients of a mineral, will be preceded by some general remarks on the mode of testing. A complete course of lectures on Mineralogy will follow.

Those who are desirous of making these sciences objects of their entire pursuit, will have an opportunity of attending a complete course of daily instruction, during eight months, in all the departments of *Quantitative* analysis, and Mineralogy.—Fee, including the above $100.

It is thus hoped, that means will be afforded for the diffusion of a science highly useful, and, at present, much demanded. Gentlemen connected with farming operations, and those who have estates in mineral districts, will find knowledge of this kind very advantageous. And it may be an inducement to such as wish to make a profession of Mineralogy, to know that at present they would hardly meet with any competition, in any part of the United States.

WM. DRAPER, M. D. Chemist to the Society,
Professor of Chemistry and Nat. Philosophy, Hampden Sidney College.

2t

Walter Nutt

THE

FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the improvement of the Practice,

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

VOL. IV. FEBRUARY 1, 1837. No. 10.

> And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." *Swift.*

PETERSBURG, VA.
PUBLISHED BY THE PROPRIETOR,
1837.

SUBSCRIPTION PRICE, FIVE DOLLARS TH[illegible]OLUME.

[*This publication consists of four sheets—postage for* 100 *miles or less,* 6 *cents—over* 10[illegible]*les* 10 *cents.*]

LIST OF PAYMENTS FOR THE FARMERS' REGISTER, MADE BY SUBSCRIBERS, OR PURCHASERS, FROM JANUARY 1st, TO JANUARY 26th, 1837.

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Arthur Lee,	Lancaster, Va
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Richard I. Gaines,	Do.
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Thomas Massie,	Nelson

FRENCH
SUGAR BEET SEED.

THE subscribers have for sale 200 lbs. of white and yellow French Sugar Beet Seed. This lot of seed was raised last season from French Seed of the finest quality, and can be recommended as fresh and pure. Also directions on the cultivation of Beet Sugar.

In store, an extensive assortment of Garden Seeds, European Field Seeds, a large collection of Flower Seeds, and will have early in the spring a superb collection of Double Dahlia Flower roots, consisting of about 200 varieties.

Feb. 1, 1837. ts. ROBERT SINCLAIR, Jr. & Co.

CYLINDRICAL STRAW CUTTER.

THE subscribers offer for sale Sinclair & Moore's improved Cylindrical Straw Cutters, of various sizes, adapted to horse or manual power.

The very important improvements made by Messrs. Sinclair & Moore on these machines, giving them extra strength and durability, have rendered them the most perfect and effective Straw Cutter in this country; they are so constructed as to be capable of cutting cornstalks and fodder, tangled hay, &c. with great ease, thus enabling the farmer to realize a profit by feeding to his cattle his corn fodder, which would otherwise in a great measure be lost. These machines are self feeders, the knives of spiral form, and act on a steel bed, in such a manner as to cut with great ease and despatch. The sizes are as follow, viz.

11 INCH BOX, suited to manual power, and capable of cutting 600 bushels of straw per day, being quite sufficient for the usual wants of farmers, price	$30 00
Extra knives for do. per sett,	4 00
14 INCH BOX, suited to manual or horse power: this size will cut 1000 bushels of straw per day, price	45 00
Extra knives for do. per sett,	5 00
20 INCH BOX, suited to horse or steam power, capable of cutting 125 bushels of straw per hour, price	75 00
Extra knives per sett,	8 00

☞ The above named machines are all made with endless leather, moveable bottoms; boxes with stationary bottoms are only made to order, being inferior, and a very trifle less in cost.

ALSO FOR SALE,

CORN SHELLERS, with vertical cast iron wheels; will shell 25 or 30 bushels per hour, price	20 00
Ditto Do. a powerful machine, adapted to horse power, and capable of shelling 80 a 100 bushels per hour, price	40 00
1800 PLOUGHS, of various patterns and sizes, including those in general use and most approved, price	4 50 a 20 00
WHEAT FANS, common Dutch and patent, price	$20 a 25 a 35 00
CULTIVATORS, for Corn and Tobacco,	5 a 6 50
COTTON GINS made to order, from patterns most approved by the southern planters, price $50 a 150 each.	
Corn and cob crushers, price	$65 00

75 Tons Plough and Machine Castings.

And in short every other implement appertaining to the wants of the farmer.

ROBERT SINCLAIR, Jr. & Co.
Light, near Pratt Street Whf.

Feb. 1, ts.

THE FARMERS' REGISTER.

Vol. IV. FEBRUARY 1, 1837. No. 10.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

ESTIMATES OF INCOME FROM FARMING IN VIRGINIA.

To the Editor of the Farmers' Register.

Sir,—I have for some time wished to send you the following communication, but a variety of circumstances have combined to prevent it. Having leisure to-day, I avail myself of the opportunity. I am induced to believe, that there are very few farmers or planters in the habit of keeping a correct account of the proceeds of their farms, viz: the various credits that ought to be given at the end of the year. The outgoings they are obliged to know, because their accounts must be regularly paid, but I believe the agriculturist frequently finds himself in arrears. This I know frequently happens, and it is generally ascribed to an unproductive farm, when it is owing entirely to neglect or extravagance. I have for a length of time entertained the opinion, that old farms in Virginia, partly exhausted, and not very judiciously managed, were paying from 10 to 12 per cent. and good farms properly cultivated, paying from 15 to 20. Some of the credits I shall give in this communication, may appear novel; but I trust, a moments reflection will convince the reader that they are correct, and ought to be allowed. The great mistake or difficulty in Virginia farming, is, that there are many unnecessary debts incurred; many slaves that are consumers, and of course render little or no service. Such expenditure requires a considerable demand on the products of the agriculturist, and is not always taken in account, or allowed to stand as a credit to the farm. If we are disposed to live beyond our income by wasting the profits of our labor, we are the sufferers, and it is certainly correct to credit the farm with all its products. This, however, will not be allowed by those who are looking forward for what they call *clear profits*. It is mortifying and extremely discouraging, to see our old farms in eastern Virginia, deserted—lands naturally the best in the world abandoned, and the inhabitants daily emigrating to the far west, in search of wealth or gain. I feel well assured, indeed, I do not hesitate to say, that nothing but a correct system of agriculture is required in eastern Virginia, to make us the happiest and most independent people upon earth. I am not extravagant, when I say a well managed *gullied* farm in Virginia, yields at this time, nearly as much profit to the owner, as the rich cotton farms of the south, (the high price of their staple to the contrary notwithstanding.) It would, at first view, seem strange, that I should advance such an opinion, but let us make the calculation. In doing this, I will attempt to give a plain statement of facts, and will not, in order to prove my assertion, refer the readers to active, energetic managers, but will refer them to my own management, on a worn farm, which has been in hard cultivation for the last sixty years. It is pretty generally known by my friends and neighbors, that I have but little taste for agricultural pursuits, and although I have a farm, and manage it in my own way, yet I am no manager; indeed, I lack energy and industry, and acknowledge with shame, that I have been through life, too fond of ease.

The farm I live on, contains 410 acres, and if brought in market, at this time, would probably sell for $3,000. Most of my slaves are hired annually, and I keep only seven employed in the field, which would make five effective hands; and as Virginia laborers, would sell for $3,500. Horses, oxen, stock, plantation utensils, &c. &c. I put down at $1,000, making a capital of $7,500; the interest of which, amounts to $450.

Let us now see how the credits of the above farm stands for one year. I have taken the year 1835, because the products of 1836 are not yet ascertained. Here, I will remark, that I have not taken any account of the number of consumers in my family, or the necessary expenses incurred on the farm. Two-thirds of the slaves are consumers, but this is my loss; the farm must be credited with its products, viz:—the increase and every thing made, grown, or manufactured. The credits are,

192½	bbls. corn, at $5,	$962.50
175	bushels wheat, $1,	175 00
250	bushels oats, at 63 cents,	157 50
6225	lbs. tobacco,	510 25
8	thousand weight fodder, at $1,	80 00
	Straw, shucks and top-fodder,	60 00
	Flax and cotton,	30 00
15	bushels sweet potatoes,	15 00
15	do. Irish do.	15 00
	Cabbage, beets, parsnips, turnips, onions, asparagus, peas, and other garden vegetables,	60 00
16	lambs (dressed,)	30 00
16	lamb skins, at 25 cents,	4 00
4	muttons (dressed,) at $3,	12 00
4	mutton skins, at 50 cents,	2 00
2800	lbs. pork, at $7 50,	210 00
120	lbs. lard, at 13 cents,	15 60
8	pigs, at 50 cents,	4 00
500	lbs. beef, at 6 cents,	30 00
50	lbs. tallow, (beef and mutton,)	6 25
2	cow skins,	4 00
100	lbs. wool, at 50 cents,	50 00
	Apples, pears, cherries, grapes, and other orchard fruits,	40 00
600	water-melons, at 12½ cents,	75 00
100	musk-melons, at 10 cents,	10 00
5	cart loads pumpkins,	10 00
16	dippers, (gourds,)	2 00
12	brooms,	1 50
8	gallons honey, at $1,50,	12 50
6	lbs. beeswax, at 25 cents,	1 50
200	chickens, at 12½ cents,	25 00
18	turkeys, at 63 cents,	11 34
15	geese, at 37½ cents,	5 62
50	doz. eggs, at 20 cents,	10 00
15	lbs. feathers, at 34 cents,	5 00
	Spinning and weaving 200 yards cloth, cutting out and making up do.	50 00
	Making 18 pair coarse shoes, at 34 cents,	6 00

220	lbs. butter, at 25 cents,	55 00
400	gallons milk, at 25 cents,	100 00
	ashes, hen-house, farm, pen and stable manure,	200 00
	Birth of 3 slaves, at $100 each,	300 00
24	young hogs, for pork, in 1836, at $1,	24 00
9	young sheep, at $1 75,	14 00
3	calves, at $3,	9 00

Negroes' Credits.

7½	bbls. corn, at $5,	$37 50	
	Blade fodder, top fodder and shucks,	3 50	
150	head cabbage, at 6 cents,	9 00	
6	doz. cucumbers, at 25 cents,	1 50	
6	doz. symlins, at 25 cents,	1 50	
3	bushels potatoes, at $1,	3 00	
1	do. onions,	1 00	
100	melons, at 12½ cents,	12 50	
	Red pepper, gouber peas, and grass nuts,	2 50	
	Pumpkins and broom-corn,	2 50	
4	bushels walnuts,	2 00	
	Trapping 3 doz. hares, at 12½ cents,	4 50	
6	white oak baskets,	3 00	
	Making and mending shoes for neighbors slaves,	5 00	
2	bbls. percimmon beer, at 12½ cents per gallon,	9 00	
6	foot-mats, at 37½ cents,	2 25	—100 25
			$3,500 31

Some of the above credits are guessed at, and the prices also, but they are not far from a correct estimate. It may be said, that I have credited the farm with many articles necessary for its support: be it so—my object in making this communication, is to give a full and fair statement of every thing made, grown or manufactured, without taking into account the expenses incurred, and given to the public for what it is worth. It may, perhaps, rouse and stimulate those who cultivate poor farms to more active exertion; for I do contend, that industrious, enterprising agriculturalists on old farms in eastern Virginia, will do better for themselves, their families, and the community in general, by remaining at home and improving their lands, than they could possibly do by emigrating to the south-west, and incurring the expense of clearing the forest, opening and improving farms, planting orchards, building houses, and forming new acquaintances and friends. This, however, is seldom regarded, we have but few Virginians at this time that love *home;* they see a great opening before them, extending beyond Virginia to the Rocky Mountains, and they are anxious to be among the first to fill it up.

You, sir, have done much for the Old Dominion, and much remains for you to do. I feel disposed to call loudly on all the Agricultural Societies of Virginia, and the literary and enlightened part of the state, to give some assistance to your laborious undertaking. We are about forming a club of some 12 or 15 gentlemen, whose duty it shall be to furnish an agricultural communication for the "Farmers' Register" every month, or oftener, if we find it convenient; and, we hope, gentlemen from other counties will come to the same determination, and fill up the Register with useful agricultural matter. I wish that I was an industrious farmer, instead of a lazy M. D. I should take great pleasure in writing and sending on agricultural communications for the "Farmers' Register," but I have been too negligent in my profession, and have ploughed the old farm up and down-hill so long, that its soil has followed the plough furrow, branches and creeks, until it has in all probability reached the Atlantic, leaving me in my 52nd year, to renovate the sub-soil, and instead of writing in my parlour for your periodical, have still to labor hard to make up for mis-spent time.

Give me leave to say, that the literary and agricultural departments of the "Farmers' Register," require some attention; there is still room for improvement. The editorial department, I think, very good—but the literary department particularly, does not blaze forth with such scintillations as might have been expected from such resources. I do not wish you to understand by this remark, that you have not done your duty ably and faithfully; but where is * * * * —and * * * * esquires—the Hon. * * * *—the Hon. * * *—Judges * * *—* * *—* * * and * * * M.D. and a hundred other literary gentlemen in Virginia? I wish to see the "Farmers' Register" travelling far beyond the agricultural limits of Virginia, and in order to do this, you must give it more sail and ballast. A gallant streamer bearing the horn of plenty, filled with the agricultural products of our highly favored land, should be seen waving on its mast, with you sir, a thirty-six pounder on its deck, to fire the grand salute. It is an excellent farming repository, containing many valuable agricultural disquisitions, and nothing is now required, but to enlist the services of the literary sons of the Old Dominion, in order to extend its influence, not only throughout the United States, but the whole civilized world, and "make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before." GALEN.

[The foregoing estimate of products we think much too high—but shall not offer corrections.

The initials which our correspondent had given above, of sundry distinguished literary gentlemen of Virginia, we have chosen to leave out, but will answer his inquiry with regard to them. The first mentioned, is a true friend and efficient aid to the Farmers' Register—often a contributor to its pages, (though less often than would be desirable,) but is to be generally condemned (like our present correspondent, Galen,) for using fictitious signatures, and thereby lessening the value of all communications of matters of fact, or of opinion resting on experience of other facts. One other, only, of the distinguished gentlemen designated above, is a subscriber to this journal, who has punctually paid his money for it, but has never furnished any other aid. As to the others—among them there is not one who subscribes for, writes for, or (so far as we know,) reads the Register, or cares whether it stands or falls. A very few of the distinguished men of Virginia have been contributors, and most valued contributors to this journal—but to not one who was deeply engaged in party politics, or holding political or judicial office, has this journal been indebted for even one line—and scarcely for very little other than the pecuniary support furnished in the few subscriptions. We are very little indebted to either the agricultural knowledge or zeal, the literary attainments, or to the public spirit and patriotism of either our public or our *great* men : yet probably, there is not one among them, who, if asked his opinion, would not readily testify in favor of the value of this journal, to agriculture and the commonwealth, and the high importance of its being well sustained.

In reply to another remark—it is readily admitted that this journal has not, nor was it ever designed to have, any pretension to be a specimen of *belles lettres.* Fine writing is highly to be prized, as an attractive garb for solid and valuable matter. But the substance is of so much more importance to an agricultural journal, than the form, that the latter, however beautiful, if the principal merit, would be deemed by us as very worthless. Yet there are very many who can state valuable facts, and furnish excellent matter for instruction, who would be altogether deterred from the attempt, if their communications were to be estimated by the standard of literary merit.]

PLASTER OF PARIS ON MARLED LAND—GREEN SAND.

To the Editor of the Farmers' Register.

December 18, 1836.

When I commenced farming, some years ago, I began to use plaster of Paris and clover; but finding several beds of marl, which I soon worked to a considerable extent, I discontinued the use of plaster. This was done the more readily, because my experiments had not satisfied me of its efficacy; and I considered the marl, which rendered certain a moderate crop of clover on almost any land, a substitute for the plaster. Last spring, Mr. C. of S., riding with me over my fields, remarked that the clover was unusually well set, but that the crop was too light. This I ascribed to the coldness of the season, and the want of strength in the land; but when told that it had not been plastered, he attributed it to that cause, and strongly urged me to have it done immediately. Rather at his instance, than from any expectation of benefit from it, I ordered some ground plaster from Haxall's mills, and had fifteen or eighteen acres of clover, of one year's growth, sown with it at the rate of about three pecks to the acre—but I regarded the experiment with so little interest, that I did not visit the place again till after harvest, and then for the purpose of marking the spots where manure would be required before the land was fallowed for wheat. I soon came to a place where the clover was inferior to the rest of the crop, but to my surprise, I found it continued so through the whole length of the bed. Passing on further, I observed the same was the case with another bed, and then I recollected the plaster. Some six or eight beds which by my directions had been left out when the plaster was sown, were most conspicuously inferior to the rest. On them the clover was small and yellow, while that which had been plastered, was fresh and green, and vigorous, and seemed to have taken a second growth. The crop there, was more than twice as heavy as on the beds which had not been sown with plaster. I never saw an experiment that was more convincing. It is entitled to the more weight, because it was made by one who did not anticipate such an effect, and its result forced itself on his attention at a time when it was not directed to the experiment. The plaster was sown about the last of May. Its effect would probably have been much greater, had it been sown in April, and in a larger quantity to the acre. The difference in the crop of clover was such as to pay for the plaster five times over.

The land had been marled with 600 or 800 bushels to the acre, some years before.

It is late in the day to be attesting the virtue of plaster of Paris, but I communicate my experiment, because it was made in conjunction with marl; and on land, level, grey, and inclining to sandy, to which plaster has not been supposed to be favorably adapted. Incredulity is much more easily removed by our own personal observation, than by the reports of others; but if this shall induce any one similarly situated to make the same experiment, he will find it much to his advantage.

In the last number of the Register, you express some doubts concerning *green sand.* Professor Rogers found it in all my beds of marl, but much more abundant in some than in others. The marl in which it most abounds, has enriched the land to which I have applied it, far more than that which contains less of it—so that I have no doubt its superior efficacy is owing to its containing a greater portion of green sand.

In your "Essay on Calcareous Manures," you mention the advantageous use of plaster on marled land and my facts are another evidence of the correctness of your work—to which my experience furnishes no exception.

W.

[Our correspondent was mistaken as to the nature of our doubts regarding *green sand.* We entertain no question that it is a useful manure, in most, if not in all cases, *in conjunction with marl or lime*—but we doubt its usefulness on an acid soil, *without* calcareous matter—its permanency—its supposed superior value under any circumstances to calcareous manures—and we more than doubt its virtue being owing, as supposed by Professor Rogers, to the action of the potash contained in green sand.

The testimony from this source to the correctness of the important doctrine first maintained in the *Essay on Calcareous Manures*, of marling causing gypsum to be active as manure, on soils where it had no effect before marling, is a powerful support—and as gratifying to the author, as our correspondent's further testimony in favor of the correctness of all the other novel views there presented and maintained.]

RAIL ROAD ACROSS THE ISTHMUS OF PANAMA.

Col. Charles Biddle, a citizen of the U. States, in conjunction with a few capitalists in this country, have obtained a contract for a rail road across the Isthmus of Panama, which promises, if completed, to be of immense importance to our commerce, and to the whole world. It must become, in a few years, the highway of nations to the Pacific Ocean, and will enable our whaling ships to make their return every six months, instead of three years, as well as save a dangerous voyage around Cape Horn.

From the Gardener's Magazine.

NOTES ON THE FOREST SCENERY IN NORTH AMERICA.

Made by Mr. James M'Nab of the Botanic Garden, Edinburgh, and Mr. R. Brown, late of Perth, during a journey taken for the express purpose of observing the characters of trees in their natural woods.

Every individual who has been accustomed, during his home travels, to pay any attention to the forest scenery in his native country, must be astonished at the great difference which a foreign land presents.

In tropical regions, the whole aspect of a country is changed by the total alteration in habit, and the luxuriancy of the forests, compared with those seen in temperate climates.

In North America, the forest scenery is sublime, and upon a very extensive scale. When looked upon by the inexperienced observer, it may not seem to afford forms different from what he has been accustomed to witness in other countries; but the practical eye must at once perceive the wonderful difference of form which the American trees present.

Before landing upon the shores at New York, the head-lands appear to the stranger from the old country, of a very dark and dismal hue, from the quantity of pines and red cedars *(Juniperus Virginiana)* which seem to be the chief inhabitants of the soils around: but on landing, the whole city and neighborhood seems like a vast garden, from the number of beautiful trees, which either grow spontaneously, or have been introduced into the avenues of the city, from more southern climes.

It is here, that the observing stranger is first impressed with the great diversity of form, and the variety of foliage furnished by American trees: but it is not to be expected that, throughout the country, this diversity of form is every where to be seen. It is much the contrary. Near the large cities none of the natural forests remain, nor can they be expected, till we penetrate beyond the reach of internal communication of rivers and lakes: for the demand of wood, as fuel and otherwise, in the neighborhood of such places is very great.

About Hoboken, in New Jersey, many very ornamental forest trees of great size are seen, and frequently covered to the summit with wild vines. Of these the *Plantalis occidentalis* (button-wood or false sycamore,) *Liriodendron tulipifera,* (white wood or tulip tree,) *Liquidamber styraciflua,* (sweet gum,) with some splendid oaks, chestnuts, limes, and honey locusts, *(Gleditschia triacanthos,)* are pre-eminent. There are also many magnificent Catalpa trees *(Catalpa syringifolia,)* with a great number of fine old weeping willows and Lombardy poplars. These last appear to be universal favorites, for they are every where to be seen, and are indeed almost the only exotic forest trees which the Americans think of planting. The Lombardy poplars, from their great abundance, give to a place a very curious, but by no means a picturesque appearance.

All over the northern parts of New Jersey, the soil is good, and the vegetation very various. In the southern parts, however, the soils are poor, and covered chiefly with pines, red cedars, and scrub oaks. The swampy grounds abound with white cedars, *(Cupressus thyoides,)* and around the borders of the swamps, the *Magnolia glauca, Kalmia latifolia, Rhododendron maximum,* with many other varieties of Azalea viscosa, Andromedas, &c. are seen in great abundance.

Proceeding from New York by steam boat up the Hudson river, towards Albany, the scenery is romantic and varied, both from the irregularity of surface, and from the ornamental nature of the trees, which in many parts grace its banks. Leaving the city upon our right, we dash along as if on the surface of a lake, no outlet being seen, from the innumerable twists and turns which the river takes. The banks, for many miles up, are covered with brushwood, the larger trees having been mostly cut down. On the left, which is the New Jersey side, the land for many miles is very bold, having shelving rocks, towering three hundred feet above the river, and clothed with red cedars.

At *Tappan Sea,* twenty-five miles up, the river attains considerable breadth. On the right, the land is laid out in fields for the cultivation of grain. Many apple and pear orchards are mingled with these fields, and produce a curious effect from the trees being placed at regular distances, and having large tufted round tops.

Passing *West Point,* fifty miles from New York, the scenery assumes quite a Highland appearance: the hills are seen elevated high above the waters, and their round summits densely studded with cedars; two miles further up, the scenery is changed from a highland to that of a lowland description; and many cultivated farms are again seen extending back into the country on both sides. On the most worthless spots by the river side, for the last forty miles, red cedars were predominent; and where soil existed in any quantity, oaks were interspersed.

About *Hampton,* sixty-seven miles up, we got into a great limestone country, and the change from the dark hue of the red cedar, to the fine lively green of the Arborvitæ, *(Thuja occidentalis.)* is at once the most striking. These trees are self-sown over the surface of the rocks and along the water edge; in general, they are finely shaped pyramidal specimens, varying from one to twenty feet in height.

At Poughkeepsie, still further up on the right, a difference begins to show itself, the ground, being now ornamented with a few exotic trees, or mixed with indigenous ones, are seen the Huntingdon and weeping willows, with Lombardy poplars; all much planted by the proprietors, both by the water's edge, and interspersed amongst the native woods.

Passing *Hyde Park* to *Rhinbach,* the same spirit for planting a few ornamental trees, seems to have prevailed: and among them were catalpas, which at this season of the year (July,) presented an interesting appearance, from the quantity of flowers which they displayed.

Here for the first time, the Catskill Mountains are seen towering high upon the left at a great distance. They are evidently wooded to the summit. Continuing onwards, on both sides, many beautiful residences are passed; and the cultivated land extends, with well defined edges, to the river, till within a mile of Albany, where the river gets much broken with islands, and the banks become low, but not destitute of that shade, which is so characteristic of American scenery.

Between Albany and Lake Champlain, the ground in general is in an excellent state of cultivation; and being well watered, is rendered, in consequence, an agreeable situation for the settler. There it was that we first caught a sight of the *Abies Canadensis*, (hemlock spruce,) and the lofty white-bark American elms, in native stations.

Entering another steam boat upon *Lake Champlain*, from the westward, the course is winding and narrowed. The woods on both sides, for the first sixteen miles, are various, the principal trees being the wild cherry, (Prunus virginica,) elms, walnut, sugar maples, with the aspen poplar, *(Populus tremuloides.)* The rocky grounds again abound in arborvitæ. After having fairly entered upon the expanse of the lake, the appearance of the lofty white or Weymouth pine, *(Pinus strobus,)* towering above the deciduous trees, on rising grounds at the base of the hills, of a dark aspect, nearly destitute of branches was remarkable.

About *Essex*, half way along, the lake widens much, and all at once the wooded rocky land by the water's edge, is changed for a rich fertile country. The different farms having their fields laid off in squares, and a large orchard attached to each, render this tract, with its natural beauties very agreeable. The soil around seemed a light rosy-colored clay, and the wood on the lower grounds was not very plentiful, but the rising grounds behind were densely studded with scraggy pines.

On reaching St. John's, the northern extremity of Lake Champlain, the forests presented the same appearance as they did where we first entered upon the Lake, with the addition of the *Abies balsamea*, (or balm of Gilead fir,) and the sugar maple, which is here in greater quantities, and larger than we had hitherto seen. Notwithstanding the great mutilation which the trees are subjected to in early spring, for their juices in the manufacture of sugar, they appear all in the most perfect state of health.

Passing onwards to *Lapraire*, on the St. Lawrence river, the only tree observed of any interest, and deserving of notice, was the Canoe birch *(Betula papyracea.)*

Several dense masses of these trees occupied the lower ground: but from their closeness, none had attained a great size. Till reaching this point, birches were by no means plentiful.

From the Southern Agriculturist.

ON GRASSES FOR SOUTH CAROLINA.

Columbia, S. C., Oct. 28, 1836.

Dear Sir,—Having been long deeply sensible of the importance of a successful cultivation of the grasses in our state, I have applied my attention to that subject, with some considerable assiduity and care, for several years past; and am sorry to say, I have not as yet met with that encouragement I had very earnestly hoped for, and had anticipated. Nevertheless, I am not so much discouraged as to deter me from further trials; nor do I, in the least, despair of ultimate and complete success, if the experiments should be persevered in, with an assiduity and a sound discriminating judgment, commensurate, in any moderate degree, with the vast importance of the object. Every planter and farmer is fully sensible of the prodigious disadvantages under which he labors, from the want of rich and abundant pasturage and forage grasses. He cultivates richly remunerating staple productions, and receives very handsome annual incomes of money; but, from the steril face of the country, as regards the grasses and forage, he finds his income unavoidably and deeply encroached upon and drained, by the annual purchase of mules, horses, pork, and beef. In fact, he finds his seemingly lucrative employment rather a tantalizing fiction than a substantial reality. Indeed, it has been asserted, by some of the profoundest writers on agriculture, and I am inclined to believe, with much truth, "that no country was ever known to be really and permanently flourishing, that was destitute of rich and succulent grasses."

That South Carolina is incapable of producing a rich supply of the grasses, it would be absurd to suppose. I remember the time myself, when almost the whole surface of the soil, especially in the upper country, was a rich natural meadow, of the most succulent and nutritious herbage and grasses: and a soil so fertile as her's is, in the production of other valuable articles, it would be preposterous to conclude, is steril in the grasses. The truth is, we forget that every climate and soil has its own peculiar adaptations to certain vegetable productions; and not less so to certain species of grasses than to any thing else. That our climate is too hot and arid for the grasses, is a mere chimerical assumption. We know that the richest pasture lands in the world are found between the tropics; and the species of grasses which luxuriate there, would at once dwindle and fail in a high northern latitude, as certainly as the northern kind do at the south. Our error, heretofore, has manifestly lain in seeking our grass seeds in climates entirely too cold. We have persisted in endeavoring to force the culture of the northern grasses in our southern climate, instead of seeking them amongst the indigenous and succulent kinds in our own soil, and elsewhere still further south. It would be absurd to attempt to force the culture of clover and blue grass in the island of Jamaica; but the Guinea-grass, first introduced by accident from Africa, luxariates there in a most extraordinary manner, and has proved to be a mine of wealth to that people. In like manner, we have no reason to despair, that with a proper spirit of enterprise and perseverance, we may yet succeed in finding some species of the grasses, that may flourish and revel in Carolina, equal to the clover and timothy of the northern states, or the Guinea-grass of Jamaica.

And although it is to be feared that many species of the native grasses best adapted to our soil, have become extinct by our negligence, yet perhaps it is not the case with all of them. And, by diligent observation, perchance, a solitary, vigorous, and succulent tussock may be found in some unfrequented nook, or perhaps in more exposed situations, which, upon trial, may prove equal to our most sanguine wishes. Witness, the Gama-grass, which is a native in almost every part of the state, and which gives a more flattering promise than any other that has ever been tried; yet this grass had never commanded the slightest attention until very recently. There may be other kinds, still superior to this, which we are treading under foot every day without notice; and which, if brought in cultivation, might cause our land to teem with animal life, and diffuse an aggregate of prosperity, wealth and human enjoyment, of which, at present, we hardly have a conception. But if there are none such here, let us not despair: let every one exert himself to introduce seeds from elsewhere. The innumerable species of grass and forage plants growing upon our luxuriant prairies of the south and west, are all, as yet, untried. And South America, for aught we know, may be producing grasses, that, if introduced here, might clothe our fields spontaneously with an inexhaustible abundance of the richest pasturage and forage. But to accomplish this desirable object, requires the united exertions of every citizen. There must be a widely diffused anxiety for effecting the object, and a pervading spirit of emulation every where, before we ought to look for success in the pursuit. A single individual, it is true, might perchance hit at once upon the very grass best adapted to our climate and soil, but it would be more an accident than any thing else; but if thousands were engaged in similar experiments at the same time, they could hardly long fail of success. In hopes therefore, of giving some stimulus to the laudable undertaking, I have been induced to offer you this brief communication; and although I have not much else than an account of failures to present to you, yet I conceive even these are not without their utility. They may serve to prevent others from repeating the same experiments, and thereby save them from disappointments and loss of time, whilst they may at once direct their attention, and make their attempts, in some other untried direction. Let no one be deterred from the undertaking, from a fear of the expense, or a loss of labor that it may require. One peck of seed is sufficiently ample for the experiment, and the labor bestowed in sowing a peck of seed is, comparatively, nothing. Experiments upon the small scale are every way to be recommended: they cost but little, and are quite sufficient for showing the result of the inquiry in hand. A careful observer may perceive, almost at a glance, after his plant gets into growth, whether it is congenially located, or not. If its adaptations are complete, it will at once throw out unequivocal evidence of the fact. It will, for the most part, exhibit vigorous habits, and will not droop or fade for slight and trifling causes. On the contrary, a plant uncongenially located, will early exhibit a delicate appearance, and will languish and droop from causes slightly adverse to it: and a peck of seed, with due attention, is quite as sufficient for ascertaining the adaptation of the plant to its soil, as many bushels would be.

I have made two trials to cultivate the red clover. One of them was made in 1816, on rich river land in Richland district. It was sowed in February, without oats, and, at the same time, was applied one bushel of gypsum to the acre. It came up well, and flourished until the oats were cut off; but there came a drought in July and August, in which it nearly all perished. I again tried it in 1832, with orchard grass, on fresh and somewhat clayey and fertile highland, in Fairfield district; and, although I applied manure somewhat liberally, and a bushel of gypsum to the acre, it did not flourish so as to make it an object to cultivate it, either for forage or as a green manure. Clover, I think, requires carbonate of lime, as well as gypsum, in the soil. In February 1832, I sowed down four acres of orchard grass seed (*Dactylis Glomerata*) on high fresh land. This soil was somewhat clayey, and naturally fertile, with a good deal of small hornblende and feldspar stones in it. I had left the lofty oaks standing upon it, about one hundred or a hundred and fifty feet apart; two bushels of my fine clean seed were put upon an acre with some red clover seed and oats—it came up very finely, and flourished until June, when we had a drought with great heat; the grass began to turn yellow in patches on the poor spots, when gypsum was applied at the rate of one bushel to the acre, this caused an immediate change in the grass—it became green and went on growing finely: in August it made an effort to seed, but they became blasted and faded. During seeding time, the grass faded and declined, but in September it began to spring again, and grew until January, when it stopped growing, but continued green underneath all winter. Early in March, 1833, it began to grow again, and flourished in an encouraging manner; in the winter, it received a pretty liberal supply of cotton-seed manure, and in June, it got a bushel of gypsum to the acre: it would have afforded rich pasturage during this spring, but being anxious to make seed, it was reserved for that purpose. In July and August, it made again another effort to seed, but the heads all blasted, the grass again partially died down; but in September it sprung up and held on the same course as of the year before.

Early in March 1834, it was ready for pasturing and fifteen mules were pastured on it every night, and every Sunday, until the latter part of July; it bore the pasturing admirably well, and was of the most substantial benefit to the mules, who would recruit on it in a short time. The mules, were again pastured on it in the autumn. Early in March, 1835, it was again ready for the mules; it had received another coat of cotton-seed manure in the winter, and grew vigorously; it was of equal service to animals this year, as it was during the last; but in August and September, it manifested a disposition to die out and to become thin on the ground. In the spring of 1836 (this year,) it had so died out as to furnish no valuable pasturage, so that I consider it has run its course, and is a failure. For it must be kept in mind, that a grass which requires cultivation with a plough or hoe, or a grass that requires very frequent sowing, which will not make seed, and where seed is costly, as this seed is, cannot be cultivated to profit with us. It is worth remarking, that this grass, in very rich spots, grew most luxuriantly, to the length of eight and ten feet; and that it grew every whit as well under the shade of the oaks, up to close around the foot of the trunks, as any where else.

In February, 1834, I sowed, broad-cast, a lot of high land, inclined to be sandy, with the tall meadow oat grass seed, (*Avena Elatior.*) The lot was highly manured, and the gass came up and looked green and vigorous; but when the heats of summer came upon it, it began to die out, and by the month of September there was scarcely a plant of it to be found.

In February of the same year, (1834,) I sowed a lot of herds-grass, or red top (*Argastis vulgaris,*) on rich river bottom land, inclining to be stiff, and dry enough for the culture of corn; the grass came up well, and continued green all the year, but never rose six inches above the ground, and in the second year had nearly disappeared.

In February of the same year, (1834,) I sowed a lot down with furze grass, on the same kind of river bottom as the last. It came up well, and continued green all the year, but never grew more than six or eight inches high; and in the second year had nearly disappeared.

In February of the same year, (1834,) I sowed a lot down with the seed of green sward, (*Poa viridis,*) on the same kind of river bottom as the two last. It came up well and flourished. It keeps green all the year, and what is important, it keeps its verdure and continues to grow, apparently, as well in the winter as in the warm season. It is naturally a short grass, and with me it is not more than two or three inches in length: it grows very thick on the ground, and is a fine soft grass. It promises to occupy the ground in a very durable manner, as it now has as firm a hold of the lot as it had the first year. And although it would not warrant the employment of valuable planting lands in this grass, yet I cannot but think if the waste stiff bottom lands on our rivers were put down in it, it would be found extremely valuable for sheep pastures. It has every appearance of being most peculiarly adapted to that animal, and particularly for winter pasturage. I have several lots of *Leersia Oryzoides* on rich boggy grounds, which some years will yield spontaneously heavy returns of excellent hay. It is an excellent grass, and grows extremely thick and rank on [wet] land, with a season exactly adapted to it; but it requires a very moist soil, which, in a wet year, as the present has been, becomes too wet to make the hay; and if it should be a much dryer soil, it will fail entirely in a dry season. This uncertainty, of course, detracts from its value; nevertheless, it is still a valuable grass, and those who have soils adapted to it would do well to cultivate it.

I have reserved an account of the Gama-grass for the last, although in the order of time it was one of my early experiments. I have done so, because it has flattered me with a much better prospect of success than any other grass, and therefore I have more to say on the subject. In the summer of 1832, I collected, with difficulty, as much Gama-grass seed as would plant a small lot. It was planted in December, (in drills eighteen inches apart,) of that year, on a sandy lot, pretty highly manured. It came up in the April following, and grew off flourishingly, which it has continued to do ever since. Being desirous of increasing my seed, I have reserved it to the present time for that purpose, and have neither fed it down nor cut it, except some small parcels, which I cut to ascertain how it would be eaten by the horses and mules, both by way of soiling and in the form of hay; which experiments have been fully satisfactory: as I have stood by, and have seen the horses, with sweet corn blades and Gama-grass hay before them, eat of each, without discrimination or preference for either—partaking first of one, and then of the other. They eat it greedily also in the withered state, by way of what is termed soiling. The grass on this plot grows with prodigious luxuriousness, the blades getting the length of ten and twelve feet, and forming a sward on the ground, as it bends down and settles, of the depth of eighteen or twenty-four inches. I have been sedulously engaged in collecting seeds from this lot, and from other sources, for which I have paid twenty-five cents a quart, or ten dollars per bushel, until I have now a lot of three or four acres on rich alluvial bottom lands. The grass here is luxuriant and fine, and next year I expect to reap a most abundant harvest from it. It has been apprehended by some, that this grass is too coarse to be eaten by horses and mules; but I am fully persuaded, indeed convinced, that this is a groundless apprehension. My own limited trials, and authenticated trials from various quarters, all concur to show, that these animals not only eat it, but they eat it with avidity. It is true it may be left to stand without cutting, until it gets too old and tough; but there is no necessity for this. Its growth is so rapid that it may be cut every month, and even at shorter intervals from April until frost, of a length of from twelve to twenty-four inches. When in this young state, it is as succulent, tender and nutritious, as any grass I ever saw.

The only objection I know of to this grass, or rather the only difficulty attending its culture, (for, in fact, I know of no objection to it,) is the difficulty and tardiness of propagating it. It yields seed in abundance, but still they are scarce, and what is likely to keep them so, is the singular manner in which the seeds mature: they form in a spike at the top of a tall seed stalk, and mature only one seed at a time. Its maturity is readily known by its dark chocolate color, but if not gathered at once, it is apt to be lost. The seed seldom adheres to the spike after maturity longer than thirty-six or forty-eight hours, and when it falls, it is concealed in so dense a sward that it is utterly useless to look after it. Of course the collection of the seeds is a most tedious process, requiring the daily attendance of hands for several weeks; and although the mature seeds vegetate with sufficient certainty, if planted in November or December, yet from the carelessness of the collectors, and especially when collected for sale, many unripe seeds are sure to be gathered, which renders their vegetation very precarious. This circumstance will doubtless retard its extension and rapid propagation, but I feel confident, it will inevitably work its way, and ultimately be found on every plantation, and then will be esteemed as second only to the richest staple production in the state. Besides its abundant yield, and its nutritious qualities, it has some certain habitudes peculiar to itself alone, which recommend its culture. In the first place, such is its special adaptations to our climate and soil, it revels with luxuriance on sandy pine lands, on stiff lands, and light lands, on the rich alluvial soil of the river bottoms, and on the highest and dryest soils, and on the moist lands of the water courses. I have never seen it growing on boggy lands, but I have seen it on the sides of creeks where it was subject to be overflowed by every freshet, and there it grows so rank and vigorous, as to show that it delights in those inundations. Again, it is not only perennial, but it forms larger and stronger roots every year, and grows ranker and stronger, and the period at which it may die out is entirely unknown. But, forming a conjecture from such circumstances as are known, it is, doubtless, a plant of many years duration. Indeed, so strong a possession does it take of the land, that after five years growth it will be impracticable to reclaim the land from it, but by the mattock and grubbing hoe. No plough in this country can do any thing with it. These are rare habits of the plant, and will strike every one as rendering it invaluable; for no grass will be found profitable which requires much pains to cultivate it, and keep it set upon the lands. And moreover, if the seeds could once be had cheaply and abundantly, it could not fail to prove one of the most powerful restorers and fertilizers of our exhausted fields and hill-sides, that has ever been tried. When once well set, all washing of the land would be at an end; and if suffered to grow uncut and unfed for four or five years, to shade the land in summer, and to spread its own substance on the land to rot in winter, it could not fail to make the poorest exhausted old field extremely rich. It would require labor to grub up the roots and reclaim the land; but when done, the roots alone would give a rich supply of manure.

I have given you these facts from the record, as I have kept a book, in which I have carefully written the dates, circumstances, and results of every experiment I have made. Although apparently unimportant, the communication of them may nevertheless, perchance, be productive of some good; and, if I should live, I may, at a future time, trouble you with some further communications.

JAMES DAVIS, M. D.

From the Gardener's Magazine.

HORSE CHESTNUT.

The following method of propagating this beautiful tree was communicated for the *N. E. Farmer*, vol. vii. p. 102, by Hon. O. Fiske, of Worcester.

For some years I took various means to obtain the vegetation of this nut, but without success. The last parcel I planted without effect I emptied on the grass until I was ready to institute some other scientific process. In planting them I accidentally and very fortunately left one. It was in leaf when I first discovered it. By a careful removal to a favorable soil it has become a fine bearing tree. All the rest perished as heretofore. Since this discovery I have not found the least difficulty. I endeavor to imitate nature in her planting the seeds of the forest.

Soon after the nuts are gathered, not allowing them to become dry, I make a slight excavation by the side of some bank in my garden, and spread them in, levelling them nearly with the surface. Care should be taken to lay the side from whence the root issues next to the earth. This posture gives the root a more speedy access to nourishment, and facilitates the exit of the stem. I then cover them with leaves or some light rubbish, and replace as much earth as is necessary to keep the covering in place. By the time the ground is ready to receive them in the spring, I find them sprouted without the loss of one in a hundred. To disengage them from the earth, after removing the covering I pass a stable-fork under the mass, and gently pry them up, taking out the nuts singly and carefully, to prevent breaking the long tender root, and transplant them in trenches. In this process I make the holes with a trowel deeper than the extent of the root. After partially filling them with light earth, I draw up the nut to within about an inch of the surface, leaving it just buried beneath it. I generally take them up the second year and cut off the tap root, that they may be removed with more ease and safety when large enough to be transplanted from the nursery.

This tree is peculiar in its process, taxing the patience of the cultivator in its early stages. The annual growth is finished about the last of June, when other trees are in their most vigorous progress. In the fifth season the stature is doubled. At this period it grows with the vigor and rapidity of other trees.

From the Village Record.

STRAWBERRIES.

I have been induced to make the present communication, from having been informed by a young man from near Salem, of the management of a bed in his father's garden, which he planted about twenty years ago, and which still continues very productive. It contains about two square perches, and the present season twenty quarts were gathered in a morning, and strawberries measuring three inches and three-fourths round, were frequently found. The manner in which this bed has been managed, and made so productive, is, as soon as the fruit is all gathered, mow the vines close off, and cover the bed four or five inches with rotten wood, drawn fresh from the land, where old logs have been left to decay. The strawberry vines will shoot through this covering and there will be no farther labor necessary but to keep the running vines cut off, to prevent their taking root; twelve inches square was the distance at which the plants of the above described bed were planted.

Fxtract from *Miscellanea Curiosa*, published in 1707.

CLAYTON'S LETTERS FROM VIRGINIA, IN 1688.

A Letter from Mr. John Clayton Rector of Crofton at Wakefield in Yorkshire, to the Royal Society, May 12, 1688, *given an account of several observables in Virginia, and in his voyage thither, more particularly concerning the air.*

Having oftentimes been urged to give an account of *Virginia* by several of the worthy members of the Royal Society, I cannot but, as far forth as I am able, obey commands whereby I'm so much honour'd, and show my respect by my ready compliance; tho' I am so sensible of my own weakness and incapacity to answer your expectations, that before-hand I must apologize for my self. And indeed by sea I lost all my books, chymical instruments, glasses and microscopes, which rendered me uncapable of making those remarks and observations I had designed: they were all cast away in Captain *Win's* ship, as they were to follow me; and *Virginia* being a country where one cannot furnish one's self again with such things, I was discouraged from making so diligent a scrutiny as otherwise I might have done, so that I took very few minutes down in writing; and therefore, since I have only my memory to rely on, which too has the disadvantage of it's own weakness and of the distance of two years since now I left the country, if future relations shall in some small points make out my mistake, I thought this requisite to justify my candor; for I ever judg'd it villanous to impose in matters of fact; but descriptions of things that depend on memory may be liable to mistakes, and yet the sincerity of the person that delivers them intire. But hereof I shall be as cautious as possible, and shall rather wave some things whereof I have some doubts, and am uncapable now of satisfying my self, than in any sort presume too far. The method I design is, first, to give an account of the air, and all such observations as refer thereto; then of the water, the earth and soil; the birds, the beasts, the fishes, the plants, the insects; and lastly, the present state of the inhabitants: But at present I shall neither trouble you nor my self with any more than an account of what refers to the air alone, being conscious the honorable society may receive such a glut with the imperfection of this, as to excuse me from a farther relation.

But before I begin, perhaps it may not be impertinent to acquaint you with some things that happen'd in our voyage. We sail'd in the ship *Judith*, Captain *Trim* commander: 'twas fly-boat built, about 200 or 250 tuns; she sprung a considerable leak. When the captain had made long and diligent search, had tried all methods that sea-men use upon such occasions, or he could think of, all in vain, and that the leak encreased, he came pensively to consult me. Discoursing with him about it, and understanding that the ship was ceiled within, so that though the leak might possibly be in the fore-part, it would fill the whole cavity betwixt the ceiling and the planks, and so run into the hold at all the crevices of the ceiling up and down: I thereupon conceived, that where it burst in betwixt the ceiling and the planks, it must needs make some noise. He told me, they had endeavored to find it out that way, and according to custom had clapt caps to their ears to hear with; but the working of the ship, the tackle and the sea, made such a noise, that they could discover nothing thereby. I happily bethought my self of the speaking trumpet; and having one which I had contrived for some other conveniences, of a differing shape from the common sorts, I bid him take it and apply the broad end to the side of the ship, the narrow end to his ear, and it would encrease his hearing as much as it augmented the voice the other way, and would ward the ear too from the confusion of foreign noise. Upon the first application, accordingly they heard it, tho' it happened to be at a considerable distance; and when they removed the trumpet nigher, they heard it as if it had been the current of a mighty river, even so distinctly, as to have apprehensions of the bigness and figure of the hole that the water came in at; so that cutting there the ceiling of the ship, they immediately stopt the leak.

In the sea I saw many little things which the seamen call carvels; they are like a jelly or starch that is made with a cast of blue in it; they swim like a small sheep's bladder above the water: downwards there are long fibrous strings, some whereof I have found near a half a yard long. This I take to be a sort of sea plant, and the strings, its roots growing in the sea, as duck-weed does in ponds. It may be reckon'd among the potential cauteries; for when we were one day becalm'd, getting some to make observations thereof, the sportful people rub'd it on one another's hands and faces, and where it touch'd it would make it look very red, and make it smart worse than a nettle. In my return for *England* we struck a haukebill turtle, in whose guts I found many of these carvels; so that it's manifest they feed thereon.

'Tis commonly asserted by the seamen, that they can smell the pines at *Virginia* several leagues at sea before they see land, but I could receive no satisfaction as to this point; I could not discern any such thing when at a moderate distance. I fear much of this may be attributed to fancy; for one day there came three or four, full scent, to tell me they were certain they smelt the pines; but it afterwards prov'd that we were at that time 200 leagues from the shoar, so that I was satisfied that was therefore meer fancy. Indeed we thought, by the general accounts of the ship, that we had been just on the coast, but all were deceived by a current we met with, that at that time set about south-east, or east-south-east, which when once becalmed we tried thus: We hoised out a boat, and took one of the scuttles that cover'd one of the hatches of the ship, tying thereto a great weight, and a strong long rope, we let it sink a considerable depth, and then fastning it to the boat, it serv'd as an anchor, that the boat could not drive; then with the glass and logg line we found the current set, as I say, eastward, at the rate of a mile and a half an hour. This current is of mischevous consequence: it does not always run one way, but as it sets sometimes as we proved easterly, so does it, as they say, set at other times westerly, whereby many ships have been lost; for then the ships being before their accounts, they fall in with the land before they are aware. Thus one year many ships were lost on Cape *Haltarasse*, and thereabouts.

Of the Air.

The cape called *Cape Henry*, lies in 36½ of the northern latitude. The air and temperature of the seasons is much govern'd by winds in *Virginia*, both as to heat and cold, driness and moisture, whose variations being very notable, I the more lamented the loss of my barometers and thermometers, for considerable observations might be made thereby, there being often great and suddain changes. The Nore and Nore-West are very nitrous and piercing, cold and clear, or else stormy. The south-east and south hazy and soultry hot. Their winter is a fine clear air, and dry, which renders it very pleasant: Their frosts are short, but sometimes very sharp, that it will freeze the rivers over three miles broad; nay, the Secretary of State assured me, it had frozen clear over *Po-*

tomack River, over against his house, where it is near nine miles over: I have observed it freezes there the hardest, when from a moist south-east, on a sudden the wind passing by the nore, a nitrous sharp nore-west blows; not with high gusts, but with a cutting brisk air, and those soils then that seem to be shelter'd from the wind, and lie warm, where the air is most stagnant and moist, are frozen the hardest, and seized the soonest, and there the fruits are more subject to blast than where the air has a free notion. Snow falls sometimes in pretty quantity, but rarely continues there above a day or two: Their spring is about a month earlier than in *England;* in *April* they have frequent rains, sometimes several short and suddain gusts. *May* and *June* the heat encreases, and it is much like our summer, being mitigated with gentle breezes that rise about 9 of the clock, and decrease and incline as the sun rises and falls. *July* and *August* those breezes cease, and the air becomes stagnant, that the heat is violent and troublesome. In *September* the weather usually breaks, suddenly, and there falls generally very considerable rains. When the weather breaks, many fall sick, this being the time of an endemical sickness, for seasonings, cachexes, fluxes, scorbutical dropsies, gripes, or the like, which I have attributed to this reason: that by the extraordinary heat the ferment of the blood being raised too high, and the tone of the stomach relaxed, when the weather breaks the blood palls, and like over-fermented liquors is depauperated, or turns eager and sharp. and there's a crude digeston, whence the named distempers may be supposed to ensue. And for confirmation, I have observed the carminative seeds, such as warm. and whose oil sheaths the acid humours that ever result from crude digestions. But decoctions that retain the tone of the stomach, as I suppose, by the making the little glands in the tunicles of the stomach squeeze out their juice, (for what is bitter may be as well offensive to the stomach, as to the palate) and then chalibiates that raise the decayed ferment, are no bad practice; after which, I conceive, armoniack spirits might be very beneficial. But their doctors are so learned, that I never met with any of them that understood what armoniack spirits were: Two or three of them one time ran me clear down by consent, that they were vomitive, and that they never used any thing for that purpose but crocus metallorum; which indeed every house keeps; and if their finger, as the saying is, ake but, they immediately give three or four spoonfuls thereof; if this fail, they give him a second dose, then perhaps purge them with 15 or 20 grains of the rosin of jalap, afterwards sweat them with *Venice* treacle, powder af snake-root, or *Gascoin's* powder; and when these fail *conclamatum est.* But to return. 'Tis wonderful what influence the air has over men's bodies, whereof I had my self sad assurances; for tho' I was in a very close warm room, where was a fire constantly kept, yet there was not the least alteration or change, whereof I was not sensible when I was sick of the gripes, of which distemper I may give a farther account in its proper place. When a very ingenious gentlewoman was visited with the same distemper, I had the opportunity of making very considerable observations. I stood at the window, and could view the clouds arise: For there small black fleeting clouds will arise, and be swiftly carry'd cross the whole element; and as these clouds arose, and came nigher, her torments were encreased, which were grievous as a laboring woman's; there was not the least cloud but lamentably affected her, and that at a considerable distance; but by her shrieks it seemed more or less, according to the bigness and nearness of the clouds. The thunder there is attended often with fatal circumstances: I was with my Lord *Howard*. of *Effingham*, the governor, when they brought word that one Dr. *A.* was killed therewith, after this manner: He was smoaking a pipe of tobacco, and looking out at his window when he was struck dead, and immediately became so stiff, that he did not fall, but stood leaning in the window, with the pipe in his mouth. in the same posture he was in when struck. But this I only deliver as report, tho' I heard the same account from several, without any contradicting it. These things are remarkable, that it generally breaks in at the gable end of the houses, and often kills persons in, or near the chimneys range, darting most fiercely down the funnel of the chimney, more especially if there be a fire, (I speak here confusedly of thunder and lightning for when they do any mischief, the crash and lightning are at the same instant, which must be from the nearness of the cloud.) One time when the thunder split the mast of a boat at *James Town*, I saw it break from the cloud, which it divided in two, and seem'd as if it had shot them immediately a mile asunder, to the eye: It is dangerous when it thunders standing in a narrow passage, where there's a thorough passage, or in a room betwixt two windows; tho' several have been kill'd in the open fields. 'Tis incredible to tell how it will strike large oaks, shatter and shiver them, sometimes twisting round a tree, sometimes as if it struck the tree backwards and forwards. I had noted a fine spreading oak in *James Town* Island: in the morning I saw it fair and flourishing, in the evening I observed all the bark of the body of the tree, as if it had been artificially peel'd off—was orderly spread round the tree, in a ring, whose semi-diameter was four yards, the tree in the centre: all the body of the tree was shaken and split, but its boughs had all their bark on; few leaves were fallen, and those on the boughs as fresh as in the morning, but gradually afterwards withered, as on a tree that is fallen. I have seen several vast oaks and other timber trees twisted, as if it had been a small willow that a man had twisted with his hand, which I could suppose had been done by nothing but the thunder. I have been told by very serious planters, that 30 or 40 years since, when the country was not so open, the thunder was more fierce, and that sometimes after violent thunder and rain, the roads would seem to have perfect casts of brimstone; and 'tis frequent after much thunder and lightning for the air to have a perfect sulphurious smell. Durst I offer my weak reasons when I write to so great masters thereof, I should here consider the nature of thunder, and compare it with some sulphurious spirits which I have drawn from coals, that I could no way condense, yet were inflammable; nay, would burn after they passed through water, and that seemingly fiercer, if they were not over-power'd therewith. I have kept of this spirit a considerable time in bladders; and tho' it appeared as if they were only blown with air, yet if I let it forth, and fired it with a match or candle, it would continue burning till all were spent. It might be worthy consideration likewise, whether those frequent thunders proceeded from the air's being more stagnant, the motion of the winds being impeded by the trees, or whether the motion of the winds being obstructed by them below, the motion might not be more violent aloft; and how far that may promote inflammability, for stacks of hay or corn that ferment with moisture, never burn, unless when brisk winds blow, that agitate and fan the little fermenting sparks, and often kindle them into an actual fire. And observance of the meteors there might perhaps not be impertinent, as both what are more rare, and what are more frequent, as of *Gosimore* in great abundance, and of those small cobwebs in a morning, which some have supposed to be meteors. *Ignes fatui*, tho' there be many boggy swamps and marshes, are seldom, if any are seen there. There be frequent little sorts of whirl-winds, whose diameter may be sometimes not past two or three yards, sometimes forty, which whisking round in a circle, pass along the earth, according to the motion of the cloud, from whence they issue; and as they pass along with their gyrous or circular motion, they carry aloft the dry leaves into the air, which fall again often in places far remote. I have seen them descend in a calm sun-shine day, as if they had come from the heavens in great showers thereof, so that all the elements seem'd filled therewith. And I could perceive them to descend from on high as far as I could possibly discern a leaf. I remember a roguish expression of a seamen, otherwise silly enough, who wondering thereat, cry'd out, "*Sure now 'tis manifest there is a world above!* and now with them 'tis the fall of the leaf." But to proceed, I thought this made it manifest, whence many preternatural showers have happen'd. I remember at Sir *Richard Atherton's* in *Lancashire*, some few years ago, there fell a great number of the seeds of ivy-berries; at first we admir'd what they were, for they were cover'd with a thin skin that was red, and resembled the figure of a small wheat corn; but afterwards they fully manifested what they were; for many sprouted and took root. I suppose they were carry'd aloft by some such whirl-wind, and let fall there. I have purposely gone into the place where I perceived this gust, which is notorious enough by the noise it makes, with rattling the leaves as it carries them aloft, and have found a fine sharp breeze of wind.

[To be continued.]

From the New York Farmer.

MECHANICAL USES OF LIME.

Preparation of Quicklime.

Under the general name of limestones are comprehendeded all mineral substances which contain not less than half their weight of carbonate of lime. Quick lime is prepared from most of these limestones, by calcination, and is characterized by the property of absorbing water with phenomena of heat, an action which, if it also cause the lime to fall to powder, is called slaking. Lime prepared from different varieties of limestone has different properties in this respect. In some cases the action is rapid and violent, the heat produced, great; in others the operation is more slow, and the heat less intense. There are also, limestones which after calcination will not slake. The limestones which are richest in carbonate of lime belong to the first variety; those which contain carbonate of magnesia in a proportion greater than 10 per cent. to the second; while the resistance to the action of the slaking in the third, is due to the presence of argillaceous matter. The two first varieties are alone suited to the preparation of mortar. The last variety will not make mortar in the usual manner, but is nevertheless of great value as an ingredient in cements which will resist the action of water. In the act of slaking quick lime, which retains, after calcination, the shape and structure of the limestone whence it is prepared, falls, as has been stated, to fine powder. It also falls to powder after exposure to the air, when it is said to be air slacked. In the first case the lime combines with water forming a solid hydrate; in the latter it absorbs carbonic acid from the atmosphere, and returns to the same chemical state which the limestone possessed before calcination.

The calcination, or, as it is usually styled *burning* of lime, is performed in chambers built of stone, which go by the name of kilns. Of these there are two descriptions, ordinary and perpetual. The ordinary lime kiln is of the shape of a truncated cone, or of a portion of an ellipsoid. The limestone is prepared for calcination by breaking it into pieces, none of which have a greater dimension than 3 or 4 in. cube. The large fragments of limestone are employed in building a rude vault, over a cavity left in the lower part of the kiln. To this cavity an entrance or door is left in the wall of the kiln. The rest of the kiln is filled up with smaller pieces. When wood is used as fuel, it is introduced by the door into the space beneath the vault, and is burnt on the floor of the kiln. When coal or turf are employed, an iron grate is provided, on which the fuel is placed, leaving an ash-pit beneath. In building the vault, the spaces between the stones are left of as great an area as possible, and in filling the kiln the largest of the remaining pieces are laid next to the vault, while the smallest fragments are used for covering the rest, and closing the top of the kiln.

The fire is at first moderate, in order that the limestone may be gradually heated. After 10 or 12 hours the quantity of fuel is gradually increased, until the mass of limestone is brought nearly to a white heat. After it has been kept for some hours at this temperature, the bulk of the mass of limestone decreases about one-sixth, and flame issues almost free from smoke, from the top of the kiln. The intensity of the heat is then gradually diminished until the fire is permitted to extinguish itself, for want of fuel. In order to complete the calcination of a given bulk of limestone in an ordinary kiln, nearly three times its volume of wood, or twice its volume of turf or coal is required. Much of this quantity of fuel is consumed in the gradual heating of the limestone and in preventing it from cooling too rapidly after the calcination is complete. It is therefore obvious that in a kiln in which the operation might be kept up without ceasing, a considerable saving of fuel might be ensured. Such a kiln is said to be perpetual. The first attempt at the construction of a perpetual kiln was made by Count Rumford.

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Preparation and Uses of Mortar.

Rationale.—When the hydrate obtained by slacking quicklime is mixed with water to the consistence of paste, a small portion of the lime is dissolved; the dissolved lime attracts carbonic acid from the atmosphere, and is precipitated upon that which remains undissolved, the water is thus left free to dissolve a new portion of the lime which is in its turn precipitated, and this successive action will be continued so long as mosture is present, or any portion of quicklime remains. The cessation of the action arises more usually from the loss of moisture by evaporation, than from the complete solution of the quicklime. A portion of the latter therefore remains, which is gradually converted into carbonate, and thus the semi-liquid paste is gradually converted into a white solid possessing but little adhesion. If silica be mixed with the lime and water, the precipitation of the carbonate takes place upon it in preference, and the adhesion between them is stronger than in the former instance. Indeed, it appears as if the chemical affinity which exists between lime and silica influences the adhesion, and that the conversion of the carbonate into silicate of lime begins, and continues to go on for ages. It is only in this way that we can account for the long series of years which elapses before mortar attains its limits of hardness, and a force of aggregation often superior to that of the limestone whence it is made. The theory of the formation of a silicate of lime is also corroborated by the act, that even in the most ancient and hardest mortars, the quantity of carbonic acid which is present, is alway less than would be required to convert the lime into carbonate. For the same reason that the adhesion of the precipitated carbonate of lime to silica is greater than to other portions of lime or carbonate, the adhesion of mortar to brick or siliceous stones is greater than to limestone. It is however necessary in all cases that the stone or other material which is to be laid in the mortar be moist, or at least do not absorb moisture. If the material absorb water from the mortar, the solution and precipitation no longer take place, and no adhesion will ensue between the mortar and the stone. In laying brick, therefore, it is necessary that it be wet before the mortar is applied, otherwise no bond will take place.

Preparation.—The lime intended for the manufacture of mortar should be either recently burnt, or should have been carefully preserved from the action of air.

Lime which has been long slaked will make as good mortar as recent quicklime, provided the latter condition have been attended to, but as it is more difficult to judge of the freedom from carbonic acid in slaked than in quicklime, it is considered preferable to use the latter rather than the former.

When the lime is prepared from a stone which is free from impurities, it slakes readily, and may be converted into mortar as the art of slaking is going forward. For this purpose, a sort of basin is formed on the ground, by means of the sand intended to enter into the composition of the mortar. The lime is thrown into the middle of this basin, and water gradually poured over it. The quantity of water must be sufficient not merely to form the solid hydrate, but to convert it into the mechanical mixture known as the milk of lime. As the quicklime falls to powder, it is gradually incorporated with the sand and water by means of a hoe, which is also of use in breaking down those parts of the lime which longest resist the action of the water.

If the lime be combined with magnesia, it slakes too slowly to permit this method to be employed. Such lime should be placed in a conical pit, water thrown upon it, and then covered up with the sand intended to be mixed with it. Days, or even weeks may elapse, before the whole mass shall have fallen to powder, but after the disintegration is complete, such lime will make as good a mortar as that prepared from a pure carbonate. It is more usual to slake such lime in the neighborhood of the kiln, and to separate the parts which have not fallen to powder by means of a screen, but this method is objectionable, as the finer and richer portions are liable to be charged with carbonic acid before they can be transported to the place where the mortar is to be prepared. A method which is preferable to either, consists in plunging the magnesian lime into a vessel of water, where it is permitted to remain until completely pulverized. The excess of water is then drawn off, and the lime with the residue of water incorporated with sand. The sand which is to be used in making mortar, ought to be made up of angular fragments of quartz. Such sand is found in the bed of running streams, or in diluvial and alluvial deposites from running water. It is designated by masons by the epithet sharp. A mixture of argillaceous matter deprives it of this quality, but as this may be separated by agitation with water, the necessary sharpness may often be acquired by washing the sand.

For laying brick or well jointed stone, fine sand is to be preferred; for common hewn stone, sand of coarser grain; and for rubble work, the mortar made with coarse sand should be mixed with small pebbles, or rather with angular fragments of a siliceous stone.

The best proportion of the materials of mortars, is one part of a pure quicklime to three of fine or four of coarse sand. If the lime be of less purity, the qantity of sand must be lessened in such manner as to bear the same proportion to the pure earth contained in the limestone.

The rapidity with which mortar sets may be much increased by the use of quicklime, ground to powder, instead of being reduced to that form by slaking. This method is the invention of Loriot, a French engineer, who supposed he had discovered the secret of the hardness of the ancient mortars. He directs that three parts of slacked lime be mixed with four of water, and that sixteen parts of pulverized brick or sand be added. After these materials are thoroughly mixed one part of quicklime ground to fine powder is to be added. This mortar has not all the valuable properties which were anticipated by its inventor. It might however, be used to advantage in building in frosty weather.

Limestones which contain siliceous or argillaceous matter are fit for the preparation of mortar, so long as the lime prepared from them retains the property of slaking, but the proportion of sand with which they can be mixed must be still further lessened by the bulk of the other earths contained in the limestone.

Hydraulic Cement.

History.—The ancients were acquainted with a substance which, when mixed with a pure quicklime and water, formed a mixture that possessed the property of hardening under water. This is a volcanic product having the form of powder, originally found at Puteoli in the neighborhood of Vesuvius, and called from the locality *Terra Puteolana.* The material is still used on the shores of the Mediterranean and is called Puzzolana.

The wants of the people of the low countries led them to seek in their own vicinity for a substitute for Puzzolana. This was found in a rock furnished by extinct volcanoes, whose traces are to be seen on the banks of the Rhine. This differs from Puzzolana in requiring a calcination to prepare it for use, and when calcined it absorbs moisture so readily that it must be carefully preserved from contact with the air, unless it be used within a short time of its manufacture. During the sixty years war, the people of Holland were cut off from a supply of this important article. In order to replace it, earth was drawn up from bottoms of their canals, formed into brick, burnt, and pulverized. This article was found to be nearly as efficacious as the native product, and both go by the common name of Terras or Trass.

Not only is there a substance which when mixed with pure lime makes an hydraulic cement, but these are varieties of limestone, which are characterized by refusing to slake when water is poured upon them, that when mixed with sand have the same valuable property. The discovery of this property seems to have been accidental, and its date unknown. Such limestones were first worked at Aberthaw in England, and Salenches in France. When the construction of the New York Canals was commenced, such limestones were found in its vicinity, and since that period quarries of the same description have been opened in various parts of the United States. It may indeed be inferred that there is hardly any calcareous formation some of the layers of which do not possess this property.

Even where native Puzzolana, Terras, or an hydraulic lime are all wanting, the example of Holland shows that artificial substitutes may be found wherever clay can be obtained.

Of all the materials for the preparation of an hydrulic cement, those which contain within themselves all the nacessary substances, and thus require no foreign matter to be mixed with them, seem to be best. Such are the septariæ found in the London Clay and used in the preparation of "Roman Cement."

Rationale.—If the scale of a smiths forge, or the black oxide of iron in any other form, is mixed with common mortar, it acquires the property of setting more rapidly, and speedily becomes so hard as to resist the action of water. Clays rich in ferruginous matter, if burnt and reduced to powder, have the same effect upon lime. It was also found that the native Terras contained from 10 to 15 per cent. of oxide of iron. It was inferred from these facts, that the property possessed by a cement of setting in water, was due to the presence of oxide of iron. Some of the most valuable hydraulic limes however, contain little or no iron, and Puzzolana is also poor in that substance. An isolated observation subsequently led to the ascription of the hydraulic property to the presence of oxide of manganese. Another view of the subject led to the hypothesis that hydraulic cement was obtained from a sub-carbonate of lime, the limestones from which it was prepared being in such a state of combination that heat could not expel more than half their carbonic acid. The theory which is now received is that of Vicat, who infers that hydraulic cement is obtained, whenever a silicate of lime is either formed in the calcination of the limestone, or generated rapidly by the action of the substances with which a pure lime is mixed. This silicate has the property of combining readily with water, and then the aqueous part of the cement speedily becomes solid. To this we may add that the ternary compounds of silica are formed with more readiness than the binary, and thus metallic oxides, alumina, and probably other earths concur in hastening the formation of the solid hydrated silicates.

Puzzolana.

Hydraulic cement may be made of Puzzolana, by mixing nine measures of a pure quicklime, or an equivalent quantity of that which is less pure, with water, and twelve measures of Puzzolana, and six measures of good sharp sand. If the place where it is to be employed in the erection of masonry is so situated that the stones may be laid above the level of water, no other preparation is necessary than in the use of common mortar. If it is to be used below the usual level of a mass of water, a coffer dam may be constructed. This is a case formed of piles and pileplank driven into the bed of the mass of water, in such manner as to resist its passage. After the coffer dam is finished, the water inclosed within it is raised by a pump, or other appropriate hydraulic engine, and the work is performed, after the water is thus discharged, precisely as if it were common masonry. When the bed is level, or can be rendered so, a caisson may be employed. This is a water-tight vessel whose bottom is flat, and whose sides are vertical. It is made large enough to contain the proposed structure and at the same time have room for the workmen and necessary scaffolding. The caisson is buoyant, and floats at the surface of the water. The building materials are introduced into it, and covered up in regular courses from its bottom. As the work advances the caisson sinks, until it rests upon the bed. After the structure has been raised above the level of the surface of the water, the sides of the caisson may be removed, but the timber bottom remains as a foundation for the masonry. Stone may also be laid in hydraulic cement beneath the surface of a mass of water by means of the diving bell.

A more rapid mode of construction was employed by the ancients, and is still used in the ports of the Mediterranean. Instead of a tight coffer dam, a mere enclosure of woodwork is formed in the water, inclosing a space of the figure of the contemplated structure. To 27 measures of hydraulic cement, made as has just been described, 16 measures of pebbles or chip stone are added, and the whole incorporated by stirring it for an hour, either with a hoe in the hands of a workman, or by the aid of machinery. The mixture is then formed into a conoidal heap, and allowed to remain at rest until a hard crust is formed on its surface. This will happen in warm dry weather in five or six hours, but in moist weather, some days may elapse before the cement acquires a proper degree of consistence. The mass is then broken up by the pickaxe, and intimately mixed for the second time by agitation. No water need be added to the mass, but it will regain its fluidity by stirring. When the water in which the structure is to be built is deep, the mixture is plunged into it by mens of a wooden case of cubical shape. This is managed by means of a windlass moveable upon a rail road, and has a sliding bottom, or a shutter fastened by hinges. When this has been lowered until no more space is left than just suffices for the opening of the shutter, the latter is permitted to open, and the cement falls to the bottom. A second case full is lowered and deposite beside this, and the surface of the two masses levelled by rakes and other appropriate instruments. When a uniform bed, of about a foot in thickness over the bottom of the whole space inclosed by the wooden partition has been thus deposited and spread, blocks of stone of not more than eight inches cube are thrown upon the cement, until an entire layer of such stones has been spread over the cement, in which they are capable of partially embedding themselves by their own weight. Upon these a second layer of cement is spread by means of the case, which is followed by a second layer of stones, and thus the level of the surface of the water is reached. The case however becomes useless when the depth of water is less than twice the vertical dimensions of the case. After the structure has been raised thus high, the cement is thrown in by baskets and hods, and the last courses may even be laid by the trowel.

In Europe, the wood which encloses this structure is usually removed, and may be employed again for the same purpose, but when wood is abundant it would probably be better to leave it as a protection to the structure, until it decays, when the masonry will probably be perfectly consolidated.

Terras, both native and artificial, may be used in the same way. So also may the powder of burnt clay or brick, of calcined ochre, and roasted clay slate.

Terras is prepared from a columnar greenstone or trap rock found near Andernach on the banks of the Rhine. This is roasted and reduced to powder. A similar stone is found on the bank of the Hudson near Fort Lee, and might no doubt be used for the same purpose. Other varieties of trap rock or basalt may be prepared for a similar use, by heating them until they begin to fuse, and grinding them to powder.

Hydraulic Lime.—Hydraulic lime is calcined in the same manner as common limestone. It is prepared by grinding it in a mill to a fine powder, and ought to be kept for use in tight casks. Any limestone which contains from 9 to 10 per cent. of argillaceous matter is slighter hydraulic, and it possesses this property in perfection when the proportion of that compound amounts to 20 or 30 per cent.

An artificial cement may be prepared by mixing 3 parts of chalk with one of clay, tempering the mixture with water, forming it into bricks, calcining, and grinding to powder. Care must be taken, that, while the heat must be sufficiently intense not only to drive off the carbonic acid from the chalk, but also the last portion of water from the clay, the mixture does not begin to fuse, for, after this stage is reached, the hydrate can no longer be formed.

It was long supposed that the hydraulic limes and artificial cement could not be used in building in a mass of water, by throwing in loose stones upon a bed of cement mixed with chip stone, as described under the head of Puzzolana. But recent experiments in France have shown that this idea is unfounded, and that the hydraulic limes mixed with common sand, have all the properties of the cements of which Puzzolana or Terras form a portion. It is necessary however, to examine experimentally the length of time which they take to set beneath the surface of the water, for this will differ with the different varieties of the natural mineral; and where the rate of setting is not such as to render the mixture hard within a few hours, the mixed cement and chip stone must be allowed to lie in heaps until it becomes hard at the surface, before it is plunged into the water.

Roman Cement.—This celebrated article is prepared in England from a stone found in nodules in the geological formation called the London clay. It is a compact substance of a brown color, susceptible of high polish. It is usually divided into irregular masses by vains of crystilized carbonate of lime. The quantity of silica and alumina contained in the brown portion is sufficient to form the cement without any further addition, when it is to be used beneath the surface of water. When thus unmixed it will set, either in the open air or in contact with water, in not more than fifteen minutes. Its properties in the two cases are however different, for it does not, if used unmixed, increase in hardness after it has once set, when merely exposed to the air; but if immersed in water, or in damp position, it gradually acquires the firmness of the strongest native limestone. It should therefore never be employed pure, except when it is to be exposed to the action of water. Where it is used merely in a moist place, two parts of good sharp sand should be mixed with three of cement; if in a position exposed to frost, three parts of sand to two of cement; while in a dry and warm climate or in covering walls exposed to the sun, at least five parts of sand should be mixed with two of cement. It is probably owing to the Roman cement, when applied as a stucco, having been used pure, and laid upon dry brick, that its use has been attended with little success in this country, for when properly prepared and applied, it has borne equally well the extreme climate of Canada, and the torrid air of the West Indies. Its use also requires an experienced workman. When it is to be mixed with sand, the two materials must be thoroughly incorporated before water is added.

A stone, identical to that which the Roman cement is prepared, has been found at Boulogne, in France, and one similar in texture, and in being veined with carbonate of lime, at Cumberland in Maryland. The poor calcareous ores of iron, found in coal formations, have also been used in preparing a cement, which has all the properties of the Roman, and goes by the same name. The material whence Roman cement is prepared has also been used in England in the preparation of artificial stone. For this purpose the cement while still liquid is poured into moulds having the figure of architectural ornaments. A similar use has recently been made of the American hydraulic cements, under the sanction of a patent.

MEMORANDA AND REFLECTIONS.

From the Journal of a Supercargo kept during a short residence in the Dutch East Indies.

Java.—Sugar and Indigo.

The contracts for sugar, though not on such advantageous terms as those for coffee, still must be exceedingly profitable to the government. The old contracts, most of which will have expired in a year or two, are at the rate 12c. or 110,00 p. picul deliverable always at the government stores. This is at the rate of $2 50 p. 100 lbs—the government furnishing to the grower of the cane, at an extremely low rate, coolies to work the same, and young cane for planting without any charge. They also advance to the manufacturer funds for building mills &c., for which they receive at contract prices the sugar until the debt is liquidated, after which they receive annually, at the stipulated price, a certain quantity of sugar—any surplus is at the command and under the control of the manufacturer—at the expiration of their contracts, the government in every case resume the lands, (it being part of their policy to continue the only possessors of the soil,) and to the manufacturer they are bound to allow a fair valuation price for his mills, &c. It is generally the case that the grower of the cane and the manufacturer of the same, are not the same individuals. The sugar, as also the coffee, undergoes an inspection. If it does not come up to the government standard, it is rejected: this in ordinary times is rigidly exacted. The sugar received at contract prices must be two-thirds of No. 1, or of inspection first quality, and one-third of No. 2, or second quality, and it is generally turned out by the manufacturer in this proportion, the lower part of the boiler mostly being of No. 2, and sometimes of very inferior sugar, the upper two-thirds of which is generally superior. The new contracts, are at the rate of 9c, equal to f 7 50 per picul, or about $1 89 per 100 lbs. At these rates, J. E. Bancks and friends are as yet the only contractors. It has been found necessary by the government, in order to hold individuals who were contractors, to their agreements, and to prevent the frauds which were daily practised to devise some means to compel them to deliver their sugar as agreed upon, and a beslypt or edict has been issued this year, which will effectually prevent them disposing of sugars which actually belong to government, and which, in order to obtain a little greater price, they conceal and plead inability to comply with their contracts.

The government never insist upon a compliance in any case where they have reason to suppose it would greatly inconvenience the individual: No sugars are now to be shipped until a certificate of origin is produced, countersigned by the resident officers of the port, and signed by the resident of the place of origin—this is again signed by the comptroller of customs and regularly noted, after which a permit for shipping will be granted; the quantity shipped upon this certificate is also noted. One of the methods of deception which has been successfully practised is to get the crops which are always inspected while growing, falsely estimated, but this edict will render such deception of no avail to the individuals, and will effectually do away with this system of cheatery. To give some idea of the method in which this is managed, I will subjoin a statement of the way in which the sugar estate is valued—say there is a field of 400 cane, if they run fair and are of a flourishing appearance—five-tenths of them are noted as young cane, No. 1—three-tenths as do. No 2—two-tenths as do. No. 3—four canes are then supposed of each to produce one cane at maturity. The No. 1, or first quality cane, being in reference to the quantity of sugar it will turn out, having nothing to do with the quantity of the manufactured article, thus:

5-10ths is	200	young cane,	50—	No. 1, or most productive in sugar.
3-10ths is	120	" "	30	" 2, less pro'e.
2-10ths is	80	" "	20	" 3, least "
Product'e	400		100	

It will readily be seen by the foregoing statement, that with the contrivance of the inspector, the estate may be undervalued, the cane being pronounced inferior—the planter has only to deliver a certain quantity, much less than his contract.

I should have wished here, if possible, to have given the quantities of sugar which are nominally fixed as the product of No. 1, 2, or 3 cane, but was unable to obtain such information. The government, however, in their contracts, generally estimate 50ps. of sugar as the produce of every 4 acres. The sugar districts of Java are the Problinge and Baserkie districts, containing 9 mills, all of which are water mills. The districts of Passawang and Malang, with their 14 water mills—Banghill having 4 mills, likewise water mills, and Sourrabaya with its 14 mills, 8 of which are cattle and 6 water mills.

The quantity of sugar produced in 1834, and delivered in 1835, or in store that year, must have been 280,960 ps.

		Piculs.
Say from the	Problinge, &c. districts,	69,000
	Surrabaya district,	19,750
	Passawang and regencies,	155,200
	Free sugars,	37,000
	Making a total of	280,950

And there is not a doubt that the next crop will greatly exceed that of 1834 and of 1835. The crops of 1837 I mean, that produced this year, 1836, and deliverable in 1837, is held in anticipation at 400,000 ps. One bow, or four acres of cane, is estimated as capable of 50 ps. of sugar—the crop this year will be as much as 65 ps. per bow—an increase of 30 per cent.

There is a land revenue to be paid by every cultivator, on the fertility of the soil, which is deducted from the amount paid by government, for the cane, the amount allowed by government is 4c, or f3,33 per pel. for cane, (all the mills under contract to government are numbered and known by this) marked on the sugar basket as the No. of the mill and the sugar district from which it comes.

Manufacture of Sugar.—The cane being ripe, is cut down and bruised, by rolling between two cylinders. The sap which issues from the cane they bruise, is caught in vessels made for the purpose—generally they are rough troughs of bamboo—from these it is conveyed into the boilers, and heated—after it has been boiled for a certain length of time, it assumes a dark color, and is then said to be the syrup of sugar—this syrup is poured into coolers, kept in a continual state of agitation, by which means the crust which otherwise would form in the process of cooling, is broken—when the temperature has been sufficiently reduced, it is poured into casks, which are perforated in a number of places, and in the holes are placed the porous bamboo, forming a rude but effective filter through which the syrup passes, leaving the sugar behind. The sugar, which has only undergone this process, is said to be in the Muscovado state. The syrup is further strained through canvass filters, mixing it with a portion of lime; it is then transferred to the pots, which are unglazed, and a cake of wet or moist clay is superadded, forming a sort of lid; after being again heated and a similar process to the former undergone, the sugar is turned out, and becomes what is known as the once clayed sugar—if this is again renewed, it becomes twice clayed sugar. The upper two-thirds of the pot is the better sugar, classed in Java as No. 1—the remaining portion being of a quality not so good, ranks as No. 2, or perhaps as molasses sugar. The manufacture of molasses in this island is almost altogether neglected, and there is no consumpiton of the same, except of a very small quantity, which is sold for immediate use to the inhabitants, and the shipping, for the supply of their crews. It is generally of a very inferior quality, being always somewhat burnt, and is mostly thrown away—the little that is sold is worth about 8 or 10 cents per gallon, or from f 4 a 6 per picul.

Indigo is cultivated to some extent in the interior of the island, and the article is ranked by the holders as equal, if not superior, to the Bengal indigo.

Its Cultivation and Manufacture.—New lands are always preferable for the culture of this plant. It requires a strong soil; and the ground must be disturbed by the plough or harrow before the introduction of the plant. If the season is a dry one, attention must be given to the young plant to ascertain that it does not suffer by the drought, and for the first week or so it must be continually watered, after which it requires comparatively little or no care, and seems to change its nature, scarcely any moisture being now requisite to its growth—indeed if the season should continue to be a wet one, the plant, although apparently in a most luxuriant state, will be found to be deteriorated, and on manufacture, the article produced, is of an inferior quality. The leaves of the young indigo are of an extremely pale green color, but in a matured state, when ripe for the vats, it assumes a dark green. The leaves and branches, when of the latter hue, are immediately separated from the plant and spread out into the sun to dry; after a few hours they are sufficiently dry to be gathered in, when they are threshed to separate them from the branches and stems, and are then pressed in tight packages and stored until the second crop shall be gathered in; when the crops of one season are all stored, they are left to undergo a fermentation, (which fermentation must be spontaneous, care being observed that nothing of a foreign nature, which would hasten it, be present.) About forty days after the second crop is stored, the leaves will be observed to have assumed a dark cream color, and should then be immediately removed to the vats. If kept for any length of time after the change, they will become black, and upon manufacture, will afford an inferior indigo, and in less quantity. The indigo leaves are, on their change to a cream color, taken from the store and thrown into vats of about 28 feet square, two feet three or four inches in depth, which are carefully constructed of tiles on the inside, well plastered and joined together. Water is now admitted into these vats, and suffered to remain upon the leaves for about two or two and a half hours, being kept in continual agitation during this period of time by stirrers—the water is then drawn off and has become a greenish shade, when it is conveyed by means of pipes or troughs into another vat, when it is still further agitated, until at last it exhibits a dark blue color, when it is tested by pouring a small quantity into shallow pans, and if it yield freely a blue deposite, lime water is at once added, and the whole repeatedly stirred for a length of time, after which it is left to settle, and the deposite which is made is kept undisturbed for a short time after the water is drawn off—which is of an amber color. The indigo on being taken from the vat, is filtered through a straining cloth, mixed with water again and boiled, the scum and dirt as it rises during the process of ebullition, is carefully removed, and the contents of the boiler when cooled, are again strained—after which they are kneaded, and pressed into cakes of about two or two and a half inches square. These are then left to dry—after which they are packed, and in this state the article is known as the indigo of commerce.

Good indigo should be clean, hard, inflammable and free from grit or sand, very light, with a specific gravity less than that of water. If the specific gravity is greater than that of water, it would be advisable, without further test, to reject it at once. It should be of a bright fine blue color, internally marked somewhat with silvery streaks, and upon friction with the back of the nail, giving a reddish coppery cast to the surface thus rubbed. It is an article in which you are liable at any time to deception, if not a constant dealer, and a very good judge of the same.

From the Genesee Farmer.

THOUGHTS ON WARMING ROOMS.

The maintaining a proper temperature in our dwelling houses through the winter season, can only be accomplished in two ways—by excluding the external air, and preventing the escape of that already warmed.

To exclude the external air, it is necessary that much greater attention be given to their construction and finishing, than is usually paid. There is scarcely a possibility of making our rooms, in which a *wood fire* is to be kept burning, too tight; the very means adopted for carrying off the smoke will ensure a sufficient circulation, and consequent renewal of the air of the room.

Where coal is used, more precaution is necessary, as in a perfectly tight room fatal consequences frequently ensue from the use of the oxygen of the air in supporting the combustion of the coal. No coal of any kind, should ever be burned in a room not provided with a proper passage for the escape of the vitiated air, and the renewal of the atmosphere of the apartment, by the introduction of that which is pure.

The idea that a room can be too tight, either for a fire place or stove, in which wood is burned, is absurd; the temperature of such a room may be raised too high, and in properly finished rooms it frequently is so; but that proves nothing, except that fuel has been wasted, and more heat produced than was necessary for the purpose required.

To have a winter residence in this climate comfortable, our dwellings should be constructed with particular reference to that subject. The large airy rooms open to the external air, so requisite in summer, are not at all suitable in winter, and the expenses of most householders are materially increased by inattention in this respect. Show should always be compelled to give way to health and comfort; and these should, if possible, always be combined with convenience and economy. The rooms to be occupied by the family should be on the least exposed part of the dwelling, and in no case should the doors open directly into the external air. Proper halls and entries assist most materially in the exclusion of winter's blasts.

If a fire-place is used for warming the room, it should be so constructed as to give out as much of the heat as possible into the apartment. To do this the fire-place must be shallow, and in combining with such a one the draft necessary to prevent smoke, and at the same time not be so strong as to force the heated air of the room too rapidly away, lies the great skill of the successful mason. In our opinion, an open fire is the most agreeable when properly managed, and we think there is about as much difference in the effect on the feelings, between an open fire and a stove, as there is between the former and that of the sun. We would give one hint to those who use fireplaces, and have no wood houses, and that is, never to fill the corners within the jambs with green snowy wood for the purpose of drying it. Much of the heat thrown into an apartment is reflected from the back and jambs, and this heat is very unprofitably employed in seasoning green wood, or melting snow. Better, where such wood must be used, to put a stick or two at a time on to a lively burning fire, and enjoy an equal temperature, than half freeze while the wood is warming, and then be as effectually roasted while it is burning.

People who use stoves, in close rooms, in most cases live in a temperature much higher than they apprehend, which is probably one great reason why such fires are in general considered less healthy than open ones. Observation has convinced us that this difference between the heat of a room with a stove, and one with an open fire, is not, on an average, less than six or eight degrees. In the matter of a fire, seeing is believing. Where a stove is used, a thermometer is absolutely essential; for the man who comes from the open air into a room heated to 75 or 80, is not satisfied without an additional stick in the stove.

But whatever may be the nature of the apparatus used for heating a room, whether a stove or a fire-place, let no one dream of a proper temperature, if he intends using green wood. What a black account will be presented to that man for settlement, who shall be called upon to answer for the weak eyes and baconed complexion of his children, and the maledictions of his spouse, occasioned by unseasoned wood. Comfort and economy, domestic quiet and a happy family, and green wood, cannot exist together.

G.

THE EARLIEST PASSAGE THROUGH THE DISMAL SWAMP.

Extract from the *Journal* of Col. William Byrd, of Westover, while acting as one of the commissioners to survey and fix the line between Virginia and North Carolina, in 1728.

1728, March 13. Early this morning our chaplain repaired to us with the men we had left at Mr. Wilson's. We had sent for them the evening before, to relieve those who had the labor oar from Coratuck Inlet. But to our great surprise, they petitioned not to be relieved, hoping to gain immortal reputation by being the first of mankind that ventured through the great Dismal. But the rest being equally ambitious of the same honor, it was but fair to decide their pretensions by lot. After Fortune had declared herself, those which she had excluded, offered money to the happy persons, to go in their stead. But Hercules would have as soon sold the glory of cleansing the Augean Stables, which was pretty near the same sort of work.

No sooner was the controversy at an end, but we sent those unfortunate fellows back to their quarters, whom chance had condemned to remain upon firm land, and sleep in a whole skin. In the mean while the surveyors carried the line 3 miles, which was no contemptible day's work, considering how cruelly they were entangled with briers and gall bushes. The leaf of this last shrub bespeaks it to be of the *alaternus* family.

Our work ended within a quarter of a mile of the Dismal abovementioned, where the ground began to be already full of sunken holes and slashes, which had here and there some few reeds growing in them.

'Tis hardly credible how little the bordering inhabitants were acquainted with this mighty swamp, notwithstanding they had lived their whole lives within smell of it. Yet, as great strangers as they were to it, they pretended to be very exact in their account of its dimensions, and were positive it could not be above 7 or 8 miles wide; but knew no more of the matter than stargazers know of the distance of the fixed stars. At the same time they were simple enough to amuse our men with idle stories of the lions, panthers, and alligators, they were like to encounter, in that dreadful place.

In short we saw plainly there was no intelligence of this *terra incognita* to be got, but from our own experience. For that reason, it was resolved to make the requisite dispositions to enter it the next morning. We allotted every one of the surveyors for this painful enterprise, with 12 men to attend them. Fewer than that could not be employed, in clearing the way, carrying the chain, marking the trees, and bearing the necessary bedding and provisions. Nor would the commissioners themselves have spared their persons on this occasion, but for fear of adding to the poor men's burthen, while they were certain they could add nothing to their resolution.

We quartered with our friend and fellow traveller, William Wilkins, who had been our faithful pilot to Coratuck, and lived about a mile from the place where the line ended. Every thing looked so very clean, and the furniture so neat, that we were tempted to lodge within doors. But the novelty of being shut up so close, quite spoiled our rest, nor did we breathe so free, by abundance, as when we lay in the open air.

13th.—Before nine of the clock this morning, the provisions, bedding, and other necessaries, were made up into packs, for the men to carry on their shoulders into the Dismal. They were victualed for 8 days at full allowance—no body doubting but that would be abundantly sufficient to carry them through that inhospitable place—nor indeed was it possible for the poor fellows to stagger under more. As it was, their loads weighed from 60 to 70 pounds, in just proportion to the strength of those who were to bear them.

'Twould have been unconsionable to have saddled them with burthens heavier than that, when they were to lug them through a filthy bog, which was hardly practicable with no burthen at all.

Besides this luggage at their backs, they were obliged to measure the distance, mark the trees, and clear the way for the surveyors every step they went. It was really a pleasure to see with how much cheerfulness they undertook, and with how much spirit they went through all this drudgery. For their greater safety, the commissioners took care to furnish them with Peruvian bark, rhubarb, and ipecacuana, in case they might happen in that wet journey to be taken with fevers or fluxes.

Although there was no need of example to inflame persons already so cheerful, yet to enter the people with the better grace, the author and two more of the commissioners accompanied them half a mile into the Dismal. The skirts of it were thinly planted with dwarf reeds, and gall-bushes; but when we got into the Dismal itself, we found the reeds grew there much taller and closer, and, to mend the matter, were so interlaced with bamboo briers, that there was no scuffling through them without the help of pioneers. At the same time we found the ground moist and trembling under our feet, like a quagmire—insomuch that it was an easy matter to run a ten-foot pole up to the head in it, without exerting any uncommon strength to do it.

Two of the men whose burthens were the least cumbersome, had orders to march before with their tomahawks, and clear the way, in order to make an opening for the surveyors. By their assistance we made a shift to push the line half a mile in 3 hours, and then reached a small piece of firm land about 100 yards wide, standing up above the rest like an island. Here the people were glad to lay down their loads, and take a little refreshment, while the happy man whose lot it was to carry the jug of rum, began already, like Æsop's bread-carrier, to find it to grow a good deal lighter.

After reposing about an hour, the commissioners recommended vigor and constancy to their fellow travellers, by whom they were answered with three cheerful huzzas, in token of obedience. This ceremony was no sooner over, but they took up their burthens, and attended the motion of the surveyors, who though they worked with all their might, could reach but one mile further, the same obstacles still attending them, which they had met with in the morning.

However small this distance may seem to such as are used to travel at their ease—yet our poor men, who were obliged to work with an unwieldy load at their backs, had reason to think it a long way; especially in a bog, where they had no firm footing, but every step made a deep impression, which was instantly filled with water. At the same time they were laboring with their hands to cut down the reeds, which were ten feet high, their legs were hampered with the briers. Besides, the weather happened to be warm, and the tallness of the reeds kept off every friendly breeze from coming to refresh them. And indeed it was a little provoking to hear the wind whistling among the branches of the white cedars, which grew here and there amongst the reeds, and at the same time not have the comfort to feel the least breath of it.

In the mean time the three commissioners returned out of the Dismal the same way they went in, and having joined their brethren, proceeded that night as far as Mr. Wilson's.

This worthy person lives within sight of the Dismal, in the skirts whereof his stocks range and maintain themselves all the winter, and yet he knew as little of it, as he did of *Terra Australis Incognita*. He told us a Canterbury tale of a North Briton, whose curiosity spurred him a long way into this great desart, as he calls it, near 20 years ago; but he having no compass, nor seeing the sun for several days together, wandered about till he was almost famished; but at last he bethought himself of a secret his countrymen make use of to pilot themselves in a dark day. He took a fat louse out of his collar, and exposed it to the open day, on a piece of white paper, which he brought along with him for his journal. The poor insect, having no eyelids, turned himself about till he found the darkest part of the heavens, and so made the best of his way to the north. By this direction he steered himself safe out, and gave such a frightful account of the monsters he saw, and the distresses he underwent, that no mortal since, has been hardy enough to go upon the like dangerous discovery.

15th.—The surveyors pursued their work with all diligence, but still found the soil of the Dismal so spongy, that the water oozed up into every footstep they took. To their sorrow too, they found the reeds and briers more firmly interwoven than they did the day before. But the greatest grievance was, from large cypresses which the wind had blown down, and heaped upon one another. On the limbs of most of them grew sharp snags pointing every way, like so many pikes, that required much pains and caution to avoid.

These trees being evergreens, and shooting their large tops very high, are easily overset by every gust of wind, because there is no firm earth to steady their roots. Thus many of them were laid prostrate, to the great encumbrance of the way. Such variety of difficulties made the business go on heavily, insomuch, that from morning till night, the line could advance no further than 1 mile and 31 poles. Never was rum, that cordial of life, found more necessary, than it was at this dirty place. It did not only recruit the people's spirits, now almost jaded with fatigue, but served to correct the badness of the water, and at the same time to resist the malignity of the air. Whenever the men wanted to drink, which was very often, they had nothing more to do but to make a hole, and the water bubbled up in a moment. But it was far from being either clear or well tasted, and had besides a physical effect, from the tincture it received from the roots of the shrubs and trees that grow in the neighborhood.

While the surveyors were thus painfully employed, the commissioners discharged the long score they had with Mr. Wilson, for the men and horses which had been quartered upon him during our expedition to Coratuck. From thence we marched in good order along the east side of the Dismal, and passed the long bridge that lies over the South Branch of Elizabeth River. At the end of 18 miles we reached Timothy Ivy's plantation, where we pitched our tent for the first time, and were furnished with every thing the place afforded.

We perceived the happy effects of industry in this family, in which every one looked tidy and clean, and carried in their countenances the cheerful marks of plenty. We saw no drones there, which are but too common, alas! in that part of the world. Though, in truth, the distemper of laziness seizes the men oftener, much, than the women. These last spin, weave, and knit, all with their own hands, while their husbands, depending on the bounty of the climate, are slothful in every thing, but getting of children—and in that only instance, make themselves useful members of the infant colony.

There is but little wool in that province, though cotton grows very kindly, and so far south, is seldom nipped by the frost. The good women mix this with their wool for their outer garments, though for want of fulling, that kind of manufacture is open and slazy. Flax likewise thrives there extremely, being perhaps as fine as any in the world; and I question not, might with a little care and pains, be brought to rival that of Egypt; and yet the men are here so intolerably lazy, they seldom take the trouble to propagate it.

16th.—The line was this day carried one mile and an half, and 16 poles. The soil continued soft and miry, but fuller of trees, especially white cedar.* Many of these were thrown down, and piled in heaps, high enough for a good Muscovite fortification. The worst of it was, the poor fellows began to be troubled with fluxes, occasioned by bad water and moist lodging; but chewing of rhubarb kept that malady within bounds.

In the mean time the commissioners decamped early in the morning, and made a march of 25 miles, as far as Mr. Andrew Mead's, who lives upon Nansimond River. They were no sooner got under the shelter of that hospitable roof, but it began to rain hard, and continued so to do great part of the night. This gave them much pain for their friends in the Dismal, whose sufferings spoiled their taste for the good cheer, wherewith they were entertained themselves.

However, late that evening, these poor men had the fortune to come upon another *terra firma*, which was the luckier for them, because the lower ground, by the rain that fell, was made a fitter lodging for tadpoles than men.

In our journey we remarked that the north side of this great swamp, lies higher than either the east or the west, nor were the approaches to it so full of sunken grounds. We passed by no less than two Quaker meeting houses, one of which had an awkward ornament on the west end of it, that seemed to ape a steeple. I must own I expected no such piece of foppery from a sect of so much outward simplicity.

That persuasion prevails much in the lower end of Nansimond county, for want of ministers to pilot the people a decenter way to heaven.

The ill reputation of tobacco planted in those lower parishes, makes the clergy unwilling to accept of them, unless it be such, whose abilities are as mean as their pay. Thus whether the churches be quite void, or but indifferently filled, the quakers will have an opportunity of gaining proselytes.

'Tis a wonder no popish missionaries are sent from Maryland to labor in this neglected vineyard, who we know have zeal enough to traverse sea and land on the meritorious errand of making converts.

Nor is it less strange that some wolf in sheep's clothing arrives not from New England, to lead astray a flock that has no shepherd. People uninstructed in any religion, are ready to embrace the first that offers. 'Tis natural for helpless man to adore his maker in some form or other, and were there any exception to this rule, I should suspect it to be among the Hottentots of the Cape of Good Hope, and of North Carolina.

There fell a great deal of rain during the night, accompanied with a strong wind. The fellow-feeling we had for the poor Dismalites, on account of this unkind weather, rendered the down we laid upon, uneasy. We fancied them half drowned in their wet lodging, with the trees blowing down about their ears. These were the gloomy images our fears suggested, though it was so much uneasiness clear-gain. They happened to come off much better, by being luckily encamped on the dry piece of ground aforementioned.

17th.—They were, however, forced to keep the Sabbath, in spite of their teeth, contrary to the dispensation our good chaplain had given them. Indeed their short allowance of provision would have justified their making the best of their way, without distinction of days. 'Twas certainly a work both of necessity and self-preservation to save themselves from starving. Nevertheless, the hard rain had made every thing so thoroughly wet, that it was quite impossible to do any business. They therefore made a virtue of what they could not help, and contentedly rested in their dry situation.

Since the surveyors had entered the Dismal, they had laid eyes on no living creature: neither bird, nor beast, insect, nor reptile, came in view. Doubtless, the eternal shade that broods over this mighty bog, and hinders the sun-beams from blessing the ground, makes it an uncomfortable habitation for any thing that has life. Not so much as a Zealand frog could endure so agueish a situation.

It had one beauty, however, that delighted the eye, though at the expense of all the other senses: the moisture of the soil preserves a continual verdure, and makes every plant an ever-green, but at the same time the foul damps ascend without ceasing, corrupt the air, and render it unfit for respiration. Not even a turkey-buzzard will venture to fly over it, no more than the Italian vultures will over the filthy Lake Avernus, or the birds in the Holy Land over the Salt Sea, where Sodom and Gomorrah formerly stood.

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* Now called juniper.—Ed.

In these sad circumstances, the kindest thing we could do for our suffering friends, was to give them a place in the litany. Our chaplain for his part did his office, and rubbed us up with a seasonable sermon. This was quite a new thing to our brethren of North Carolina, who live in a climate where no clergyman can breathe, any more than snakes in Ireland.

For want of men in holy orders, both the members of the council, and justices of the peace are empowered by the laws of that country to marry all those who will not take one another's word. But for the ceremony of christening their children, they trust that to chance. If a parson come in their way, they will crave a cast of his office, as they call it, else they are content their offspring should remain as arrant pagans as themselves. They account it among their greatest advantages, that they are not priest-ridden; not remembering that the clergy is rarely guilty of bestriding such as have the misfortune to be poor.

One thing may be said for the inhabitants of that province, that they are not troubled with any religious fumes, and have the least superstition of any people living. They do not know Sunday from any other day, any more than Robinson Crusoe did, which would give them a great advantage, were they given to be industrious. But they have so many Sabbaths every week, that their disregard of the seventh day has no manner of cruelty in it, either to servants or cattle.

18th.—It was with some difficulty we could make our people quit the good cheer they met with at this house, so it was late before we took our departure; but to make us amends, our landlord was so good as to conduct us ten miles on our way, as far as the Cypress Swamp, which drains itself into the Dismal. Eight miles beyond that, we forded the waters of Coropeak, which tend the same way, as do many others on that side. In six miles more, we reached the plantation of Mr. Thomas Spight, a grandee of North Carolina. We found the good man upon his crutches, being crippled with the gout in both his knees.

Here we flattered ourselves we should by this time meet with good tidings of the surveyors, but had reckoned alas! without our host; on the contrary, we were told that the Dismal was at least thirty miles wide in that place. However, as nobody could say this on his own knowledge, we ordered guns to be fired, and a drum to be beaten; but received no answer, unless it was from that prating nymph, Echo, who like a loquacious wife, will always have the last word, and sometimes return three for one.

It was indeed no wonder our signal was not heard at that time by the people in the Dismal, because in truth they had not then penetrated one-third of their way. They had that morning fallen to work with great vigor, and finding the ground better than ordinary, drove on the line 2 miles and 38 poles. This was reckoned an Herculean day's work—and yet they would not have stopped there, had not an impenetrable cedar thicket checked their industry. Our landlord had seated himself on the borders of this Dismal, for the advantage of the green food his cattle find there all winter, and for the rooting that supports his hogs. This I own is some convenience to his purse, for which his whole family pay dear in their persons; for they are devoured by moschetoes all the summer, and have agues every spring and fall, which corrupt all the juices of their bodies, give them a cadaverous complexion, and besides, a lazy creeping habit, which they never get rid of.

19th.—We ordered several men to patrole on the edge of the Dismal, both towards the north and towards the south, and to fire guns at proper distances. This they performed very punctually, but could hear nothing in return, nor gain any sort of intelligence. In the mean time whole flocks of women and children flew hither to stare at us with as much curiosity, as if we had lately landed from Bantam, or Morocco.

Some borderers too had a great mind to know where the line would come out, being for the most part apprehensive lest their lands should be taken into Virginia. In that case they must have submitted to some sort of order and government; whereas, in North Carolina, every one does what seems best in his own eyes. There were some good women that brought their children to be baptized, but brought no capons along with them, to make the solemnity cheerful. In the mean time it was strange that none came to be married in such a multitude, if it had been only for the novelty of having their hands joined by one in holy orders: yet so it was, that though our chaplain christened above one hundred, he did not marry so much as one couple during the whole expedition. But marriage is reckoned a lay contract in Carolina, as I said before, and a country justice can tie the fatal knot there, as fast as an archbishop.

None of our visiters could however tell us any news of the surveyors, nor indeed was it possible any of them should at that time, they being still laboring in the midst of the Dismal. It seems they were able to carry the line this day no further than one mile and 51 poles—and that whole distance was through a miry cedar bog, where the ground trembled under their feet most frightfully. In many places too, their passage was retarded by a great number of fallen trees, that lay horsing upon one another.

Though many circumstances concurred to make this an unwholesome situation, yet the poor men had no time to be sick, nor can one conceive a more calamitous case than it would have been to be laid up in that uncomfortable quagmire. Never were patients more tractable, or willing to take physic, than these honest fellows; but it was from a dread of laying their bones in a bog, that would soon spew them up again. That consideration also put them upon more caution about their lodging.

They first covered the ground with square pieces of cypress bark, which, now in the spring, they could easily slip off the tree for that purpose. On this they spread their bedding—but unhappily the weight and warmth of their bodies made the water rise up betwixt the joints of the bark, to their great inconvenience. Thus they lay not only moist, but also exceedingly cold, because their fires were continually going out. For no sooner was the trash upon the surface burnt away, but immediately the fire was extinguished by the moisture of the soil, insomuch that it was great part of the sentinel's business to rekindle it again in a fresh place every quarter of an hour. Nor could they indeed do their duty better, because cold was the only enemy they had to guard against in a miserable morass, where nothing can inhabit.

20th.—We could get no tidings yet of our brave adventurers, notwithstanding we despatched men to the likeliest stations to enquire after them. They were still scuffling in the mire, and could not possibly forward the line this whole day more than one mile and 64 chains. Every step of this day's work was through a cedar bog, where the trees were somewhat smaller, and grew more into a thicket.

It was now a great misfortune to the men to find their provisions grow less, as their labor grew greater. They were all forced to come to short allowance, and consequently to work hard without filling their bellies. Though this was very severe upon English stomachs, yet the people were so far from being discomfited at it, that they still kept up their good humor, and merrily told a young fellow in the company, who looked very plump and wholesome, that he must expect to go first to pot, if matters should come to extremity.

This was only said by way of jest, yet it made him thoughtful in earnest. However, for the present, he returned them a very civil answer, letting them know that, dead or alive, he should be glad to be useful to such worthy good friends. But after all, this humorous saying had one very good effect; for that younker, who before was a little inclined by his constitution to be lazy, grew on a sudden extremely industrious, that so there might be less occasion to carbonade him for the good of his fellow-travellers.

While our friends were thus embarrassed in the Dismal, the commissioners began to lie under great uneasiness for them. They knew very well their provisions must by this time begin to fall short, nor could they conceive any likely means of a supply. At this time of the year both cattle and hogs had forsaken the skirts of the Dismal, invited by the springing grass on the firm land. All our hopes were, that Providence would cause some wild game to fall in their way, or else direct them to a wholesome vegetable for subsistence. In short, they were haunted with so many frights on this occasion, that they were in truth more uneasy than the persons whose case they lamented.

We had several visitors from Edenton in the afternoon, that came with Mr. Gale, who had prudently left us at Coratuck to scuffle through that dirty country by ourselves. These gentlemen having good noses, had smelt out, at 30 miles distance, the precious liquor with which the liberality of our good friend, Mr. Mead, had just before supplied us. That generous person had judged very right, that we now had got out of the latitude of drink, proper for men in affliction, and therefore was so good as to send his cart laden with all sorts of refreshments, for which the commissioners returned him their thanks, and the chaplain his blessing.

21st.—The surveyors and their attendants began now in good earnest to be alarmed with apprehensions of famine, nor could they forbear looking with some sort of appetite upon a dog, that had been the faithful companion of their travels.

Their provisions were now near exhausted. They had this morning made the last distribution, that so each might husband his small pittance as he pleased. Now it was that the fresh colored young man began to tremble, every joint of him, having dreamed the night before that the Indians were about to barbecue him over live coals.

The prospect of famine determined the people, at last, with one consent, to abandon the line for the present, which advanced but slowly, and make the best of their way to firm land. Accordingly they set off very early, and by the help of the compass, which they carried along with them, steered a direct westerly course. They marched from morning till night, and computed their journey to amount to about 4 miles, which was a great way, considering the difficulties of the ground. It was all along a cedar swamp, so dirty and perplexed, that if they had not travelled for their lives, they could not have reached so far.

On their way they espied a turkey-buzzard, that flew prodigiously high to get above the noisome exhalations that ascend from this filthy place. This they were willing to understand as a good omen, according to the superstition of the ancients, who had great faith in the flight of vultures.

However, after all this tedious journey, they could yet discover no end of their toil, which made them very pensive, especially after they had eat the last morsel of their provisions. But to their unspeakable comfort, when all was hushed in the evening, they heard the cattle low, and the dogs bark very distinctly, which, to men in that distress, was more delightful music than Faustina or Farinelli could have made. In the mean time the commissioners could get no news of them from any of their visiters, who assembled from every point of the compass.

But the good landlord had visiters of another kind, while we were there; that is to say, some industrious masters of ships, that lay in Nansimond River. These worthy commanders came to bespeak tobacco from these parts, to make up their loadings, in contempt of the Virginia law, which positively forbad their taking in any made in North Carolina. Nor was this restraint at all unreasonable, because they have no law in Carolina either to mend the quality, or lessen the quantity of tobacco, or so much as to prevent the turning out of seconds*—all which cases have been provided against by the laws of Virginia. Wherefore, there can be no reason why the inhabitants of that province should have the same advantage of shipping their tobacco in our ports, when they will by no means submit to the same restrictions that we do.

22nd.—Our patrole happened not to go far enough to the northward this morning; if they had, the people in the Dismal might have heard the report of their guns. For this reason they returned without any tidings, which threw us into a great, though unnecessary perplexity. This was now the ninth day since they entered into that inhospitable swamp, and consequently we had reason to believe their provisions were quite spent.

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* By "*seconds*" is meant the second growth of tobacco, made from the suckers, which spring up after the plant had matured, and been cut down.—Ed.

We knew they worked hard, and therefore would eat heartily, so long as they had wherewithal to recruit their spirits, not imagining the swamp so wide as they found it. Had we been able to guess where the line would come out, we would have sent men to meet them with a fresh supply. But as we could know nothing of that, and as we had neither compass nor surveyor to guide a messenger on such an errand, we were unwilling to expose him to no purpose: therefore, all we were able to do for them in so great an extremity, was to recommend them to a merciful Providence.

However long we might think the time, yet we were cautious of shewing our uneasiness, for fear of mortifying our landlord. He had done his best for us, and therefore we were unwilling he should think us dissatisfied with our entertainment. In the midst of our concern, we were most agreeably surprised just after dinner, with the news that the Dismalites were all safe. These blessed tidings was brought us by Mr. Swan, the Carolina surveyor, who came to us in a very tattered condition.

After very short salutations, we got about him as if he had been a Hottentot, and began to inquire into his adventures. He gave us a detail of their uncomfortable voyage through the Dismal, and told us, particularly, they had pursued their journey early that morning, encouraged by the good omen of seeing the crows fly over their heads; that after an hour's march over very rotten ground, they on a sudden began to find themselves among tall pines that grew in the water, which, in many places, was knee-deep. This pine swamp, into which that of Coropeak drained itself, extended near a mile in breadth, and though it was exceedingly wet, yet was much harder at the bottom than the rest of the swamp: that about ten in the morning they recovered firm land, which they embraced with as much pleasure, as shipwrecked wretches do the shore.

After these honest adventurers had congratulated each others' deliverance, their first inquiry was for a good house, where they might satisfy the importunity of their stomachs. Their good genius directed them to Mr. Brinkley's, who dwells a little to the southward of the line. This man began immediately to be very inquisitive, but they declared they had no spirits to answer questions till after dinner.

"But pray gentlemen," said he, "answer me one question at least: what will you have for your dinner?" To which they replied, "No matter what, provided it be but enough." He kindly supplied their wants as soon as possible, and by the strength of that refreshment, they made a shift to come to us in the evening, to tell their own story. They all looked very thin, and as ragged as the Gibeonite ambassadors did in the days of yore. Our surveyors told us they had measured ten miles in the Dismal, and computed the distance they had marched since, to amount to about five more: so they made the whole breadth to be 15 miles in all.

23rd.—It was very reasonable that the surveyors, and the men who had been sharers in their fatigue, should now have a little rest. They were all, except one, in good health and good heart, blessed be God, notwithstanding the dreadful hardships they had gone through. It was really a pleasure to see the cheerfulness wherewith they received the order to prepare to re-enter the Dismal on the Monday following, in order to continue the line from the place where they had left off measuring, that so we might have the exact breadth of that dirty place. There were no more than two of them that could be persuaded to be relieved on this occasion, or suffer the other men to share the credit of that bold undertaking. Neither would these have suffered it, had not one of them been very lame, and the other much indisposed.

By the description the surveyors gave of the Dismal, we were convinced that nothing but the exceeding dry season we had been blessed with, could have made the passing of it practicable. It is the source of no less than five several rivers, which discharge themselves southward into Albemarle Sound, and of two that run northerly into Virginia. From thence, it is easy to imagine that the soil must be thoroughly soaked with water, or else there must be plentiful stores of it under ground, to supply so many rivers—especially since there is no lake, or any considerable body of that element to be seen on the surface. The rivers that head in it from Virginia, are the South Branch of Nansimond, and the West Branch of Elizabeth—and those from Carolina, are North-West River, North River, Pasquotank, Little River, and Perquimons.

There is one remarkable part of the Dismal lying to the south of the line, that has few or no trees growing on it, but contains a large tract of tall reeds; these being green all the year round, and waving with every wind, have procured it the name of the "Green Sea."

We are not yet acquainted with the precise extent of the Dismal, the whole having never been surveyed: but it may be computed at a medium to be about 30 miles long, and 10 miles broad, though where the line crossed it, it was completely 15 miles wide. But it seems to grow narrower towards the north, or at least does so in many places.† The exhalations, that continually rise from this vast body of mire and nastiness, infect the air for many miles round, and render it very unwholesome for the bordering inhabitants. It makes them liable to agues, pleurisies, and many other distempers that kill abundance of people, and make the rest look no better than ghosts. It would require a great sum of money to drain it; but the public treasure could not be better bestowed than to preserve the lives of his majesty's liege people, and at the same time render so great a tract of swamp very profitable, besides the advantage of making a channel to transport, by water carriage, goods from Albemarle Sound into Nansimond and Elizabeth rivers in Virginia.

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28th.—Our time passed heavily in our quarters, where we were quite cloyed with the Carolina felicity of having nothing to do. It was really more insupportable than the greatest fatigue, and made us even envy the drudgery of our friends in the Dismal: besides, though the men we had with us were kept in exact discipline, and behaved without reproach, yet our landlord began to be tired of them, fearing they would breed a famine in his family.

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† This supposition of the breadth of the swamp was greatly short of the truth. According to the latest map, it is more narrow where the line crossed than at any more northern part, until the termination is nearly reached.—Ed.

Indeed so many keen stomachs made great havoc amongst the beef and bacon which he had laid in for his summer provision, nor could he easily purchase more at that time of the year with the money we paid him—because people having no certain market, seldom provide any more of these commodities than will barely supply their own occasions. Besides, the weather was now grown too warm to lay in a fresh stock so late in the spring. These considerations abated somewhat of that cheerfulness with which he bid us welcome in the beginning, and made him think the time quite as long as we did, till the surveyors returned.

While we were thus all hands uneasy, we were comforted with the news that, this afternoon, the line was finished through the Dismal. The messenger told us it had been the hard work of three days, to measure the length of only 5 miles, and mark the trees as they passed along; and by the most exact survey, they found the breadth of the Dismal in this place, to be completely 15 miles.

How wide it may be in other parts, we can give no account; but believe it grows narrower towards the north. Possibly, towards Albemarle Sound it may be something broader, where so many rivers issue out of it. All we know for certain, is, that from the place where the line entered the Dismal, to where it came out, we found the road round that portion of it, which belongs to Virginia, to be about 65 miles. How great the distance may be from each of those points, round that part that falls within the bounds of Carolina, we had no certain information—though it is conjectured it cannot be so little as 30 miles: at which rate the whole circuit must be about an hundred. What a mass of mud and dirt is treasured up within this filthy circumference, and what a quantity of water must perpetually drain into it from the rising ground, that surrounds it on every side?

Without taking the exact level of the Dismal, we may be sure that it declines towards the places where the several rivers take their rise, in order to carrying off the constant supplies of water. Were it not for such discharges, the whole swamp would long since have been converted into a lake. On the other side, this declension must be very gentle, else it would be laid perfectly dry by so many continuous drains: whereas, on the contrary, the ground seems every where to be thoroughly drenched, even in the dryest season of the year.

The surveyors concluded this day's work with running 25 chains up into the firm land, where they waited farther orders from the commissioners.

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For the Farmers' Register.

THE DIFFERENCE OF CLIMATE BETWEEN THE EASTERN SIDE OF THE CONTINENT OF NORTH AMERICA AND EUROPE.

Review. *An Essay on the Climate of the United States: 8 vo. pp. 44, 2nd ed: Philadelphia,* 1833.

This pamphlet appears to have been originally published in 1809, and re-published in 1833, with the addition of an appendix containing several notes.

This essay is, as the title page informs us, an inquiry into the causes of the difference in climate between the eastern side of the continent of North America and Europe—the appendix being mainly occupied with a new solution of the question, why the temperature of western Europe, is higher than that of the eastern coasts of America in the same latitudes.

The author rejects the common notion that the temperature will be mitigated by clearing and cultivating the surface, and gives an instance; China, an empire so well cultivated, which is yet subject to extreme vicissitudes of heat and cold. He attributes the difference between the climate of the opposite shores of Europe and America, to the prevalence of the westerly winds. These winds, he says, blowing over the American continent, make the winter colder, and the summer warmer, in North America—while blowing over the Atlantic, they make the climate of Europe milder in summer and winter both—the same causes thus producing opposite effects in the two continents. The writer next investigates the cause of the prevalence of westerly winds, in an argument, elaborate, abstruse, and, perhaps, from the nature of the subject, somewhat vague and conjectural. He contends that the trade winds, impeded in their course by the American continent, return by a sort of eddy current in a westerly direction.

It must be confessed, that the nature of the winds is very obscure—"they blow where they list, and no man knoweth whence they come, nor whither they go." There are so many currents, and under-currents, and tides of air—so many changes by rarefaction and condensation—the revolutions of the earth, and of the sun, and the currents of the ocean—that it requires a despotic Æolus to reduce them to order and regulate their fury.

To solve the question of the higher temperature of the European countries of the west, than that of the eastern coasts of North America in the same latitude, the writer argues that the greater body of the northern Atlantic, must be to the south—where being exposed to the more vertical rays of the sun, the waters become heated—this heat is communicated to the atmosphere, and that the winds blowing from the west, over the Atlantic, impart a milder temperature to the western countries of Europe, than is enjoyed on the coasts of North America in the same latitudes—and that the gulf stream tends also to produce the same effect. To these speculations in abstract physical geography, succeed some observations of a more practical bearing. The essay, denies that there have been such vast changes in the climate of European countries, as have been insisted on by some writers, and the author concludes, that where trees and plants incapable of withstanding hard frosts are indigenous, we may infer that the climate is not a severe one.

He thinks that the clearing and cultivation of a country, instead of making the climate milder, may cause greater extremes of heat and cold; and hence, the increased backwardness of spring and lateness of autumn, observable in this country. In answer to the opinion, that clearing forests will cause the surface to become more dry, and consequently warmer—he says, that the air does not become temperate, in proportion, as it becomes dry—because fluids are capable of being heated as well as solids, and the air of Europe is more moist than ours, and yet more mild.

He mentions, that in elevation and figure, the northern parts of Europe, such as the countries on the south border of the Baltic sea, resemble the south-eastern parts of the United States—while the countries to the south of Europe, and along the north border of the Mediterranean sea, resemble rather the mountainous districts of Pennsylvania, Virginia and the Carolinas.

"Having endeavored to prove that the severity of our climate, and that of the eastern shores of Asia, is owing to the prevalence of the westerly winds, and that the same cause produces an opposite effect on the western coasts of both continents; and having attempted to account for it by the currents of air which constantly move across the Atlantic and Pacific oceans, from east to west, within the tropics; I should here conclude this essay, were I not desirous that these speculations might be the means of inducing persons of better information and more leisure, to pursue the inquiry, and were I not persuaded, that conclusions might be drawn from these positions which would lead to useful results.

"Whether the physical or intellectual powers of the human race are affected by climate, has frequently been the subject of discussion among those who have directed their attention to questions of this nature; and whether our climate, being liable to greater extremes of heat and cold than that of Europe, operates favorably or otherwise on our faculties, are questions with which I do not pretend to be conversant, and which to any practical purpose it seems unnecessary to discuss. The United States, lying within the temperate zone, their climate, subject as it is to great variations, must on the whole, be classed among the temperate; and men of great endowments, both mental and corporeal have been born and reared in countries that are subject to greater cold, and in others, where the heat is more intense.

"What effect our climate has on animals, as compared with that of Europe, and how far our modes and arts of life, especially the most generally practised and most important of all arts, that of husbandry, are influenced by climate, how far by habit; which of these, brought by our ancestors from Europe and still followed by their posterity, ought to be abandoned as not suited to the vicissitudes of our seasons; and what benefits would accrue from adopting others at present unknown, or little practised among us; are topics of no little moment, and which hitherto have not been much attended to. Practical men seldom apply their thoughts to such subjects, and more seldom communicate them to the public; and it has happened, rather unfortunately, perhaps, that some eminent European writers, having erroneously taken it for granted, that our climate was not only colder, but more moist than that of Europe, and having drawn conclusions from that supposed fact unfavorable to this country, some of our most distinguished citizens, eager to detect error, and zealous for the honor of their country, not content with refuting these positions, have gone into the opposite extreme, and have contended that our climate was equally temperate with that of Europe, in the same latitudes; or if not so now, that it would gradually approach the same standard, as our forests should be cleared, and cultivation extended over the face of the country. Had it been admitted that our climate was less temperate, and the difference been traced to a permanent cause, instead of controverting an unquestionable fact, or looking for changes which are never to happen, I cannot but believe that many new improvements would have been struck out, and that various important branches of agriculture would have been established among us, that are at present unknown; of these, perhaps, the most important, is the culture of the vine. Could we substitute for our beverage the pure and wholesome juice of the grape, instead of the liquid poisons obtained by distillation, so fatal to the health and morals of the laborious part of the community, what a change would be effected in the face of our country? How many industrious families would be saved from ruin! The habit of drinking fermented liquors has prevailed from the earliest ages among the race of men from which we are descended; and though the abuse of them, like that of every other good, no doubt has been productive of evil, it can hardly be questioned that they have added more to the stock of human enjoyment, than they have taken from it. The use of ardent spirits, which was unknown among the ancients, has produced fewer benefits, and incalculably greater mischiefs. Drunkenness is a much more prevalent vice, and is much more fatal among those who are addicted to the use of distilled liquors, than those accustomed to the use of wine or beer.

"No one, at all acquainted with human nature, will ever expect that the people of this country, any more than the present inhabitants of Europe, will ever abandon the use of intoxicating drinks; and ardent spirits will be in general use among the mass of the community, until a substitute is found. That wine would in a great measure supplant them, need not be doubted, if it could be produced in our country (for it is idle to expect it from abroad) in sufficient plenty for general use."—pp. 26—29.

That "drunkenness is a much more prevalent vice, and is much more fatal among those who are addicted to the use of distilled liquors, than those accustomed to the use of wine or beer," is not a singular opinion, and to a certain degree, is no doubt well-founded; but that it must be taken with some restriction, will appear from the following quotations.

"On my return to Oran, the same day I was struck, though not for the first time, with proofs of the excessive inebriety of the French common soldiers."—*Campbell's letters from Algiers*, page 283.

"By all I can learn, there never was a time when drunkards did not abound in France. I do assure you, that in the course of passing between Paris and London, I have been more struck by drunkenness in the streets of the former, than of the latter."

"Now I take it, this word *grise*, contains the essence of the superiority of wine over whiskey. It means *fuddled*—a condition from which one recovers more readily, than from downright drunkenness, and of which the physical effects are not so injurious.

I believe the consequences of even total inebriety from wine, are not as bad as those which follow inebriety from whiskey and rum. But your real *amateur* here, is no more content with wine, than he is with us; he drinks a white brandy, that is pretty near the pure alcohol."

"The official reports, show ten thousand cases of females arrested for drunkenness in Paris, during the last year."—*Cooper's Switzerland.*

The essay proceeds to consider the culture of the vine—and the opinions expressed, though not such as we can entirely concur in, yet on this, as on all other points, well deserves the reader's attention. The main object of preparing these observations, was to present the passages of our author in which agricultural matters are introduced.

"It is much to be regretted, that the efforts made at different periods, and in various parts of the country, to attain this object, have hitherto been so unsuccessful as to induce a very general belief that there is something in our soil or climate so unfriendly to the vine, that it can never be cultivated here with success. As to the former, we know that the finest wines of Europe are the produce of soils of various descriptions, extremely different from each other, and it cannot be doubted that we have the same varieties here. The difficulty, if there be one, independent of our want of experience, must, I think, be referred to climate. Possibly it is insurmountable in some parts of the country; but I am persuaded that there are large districts within the United States, in which the grape would find as genial a climate as in Europe. The want of success that has hitherto been experienced, I think may have happened by the selection of kinds not suited to our climate. The vine, as well as other fruits which have been long cultivated, runs into innumerable varieties; and every wine country in Europe has those which have been found suited to its climate, or in a succession of ages have become accommodated to it. In selecting varieties, two leading circumstances would seem to require attention; the first, that they should be able to stand the severity of our winter; and the second, that the grape should ripen at that season of the year best suited to the making of wine. If the vintage take place during the summer heats, the wine becomes acid by excessive fermentation; and on the other hand, a grape that does not attain its maturity some time before the usual period of the setting in of the frost, might often be overtaken by the winter, and a year's labor lost. Indeed, if in a climate more temperate than our own, we should find a grape that united these two requisites, it might still fail, when removed to a climate different in other respects from its own. Various kinds of wheat from the Mediterranean have been occasionally sown in this country, and though they resist the cold of our winter, and ripen at the same time with the ordinary kinds, they have generally yielded an imperfect grain. We ought, therefore, in choosing varieties of grapes, to look for them in those countries whose climate most nearly approaches that of the district where the experiment is intended to be made. In Italy, Spain, and Portugal, and perhaps the south of France, we should doubtless find grapes of different kinds that would not ripen too early in the season; but being none of them accustomed to the severity of a winter like ours, it is highly probable that from this cause, most, if not all of them, would fail here. The vines of Burgundy and Champagne cannot be expected to succeed, both on account of the severity of our winters, and because the grapes would ripen too early in the autumn;* and yet, perhaps, all the varieties of grapes on which experiments have been made, have come from these countries. If we ever succeed, I think it must be by bringing our vines from the interior of Germany, from Hungary, or perhaps from Switzerland, countries remote from the sea, and whose climate is not much unlike that of many parts of our own.

"It is a known fact, that as we advance from the sea-coast into the interior of the continent of Europe, from west to east, the winters grow colder and the summers warmer; and in consequence of this difference of climate, the vine is found to succeed in the more eastern and less temperate regions, much further to the north than on the sea-coast. The neighborhood of *Nantz*, for instance, a little to the north of latitude 47°, is the northern limit of the wine district of France, on the western coast; but as we go to the eastward, the cultivation of the vine extends further and further to the north, and on the banks of the Rhine excellent wines are produced, at least three degrees further north, and where the severity of the winter is much greater.*

"In Germany, the line extends still further north, into Saxony; and in Hungary the vintage of Tokay, the richest perhaps in the world, is gathered considerably to the north of latitude 48°. Were our vines brought from these countries to those parts of the United States most like them in climate, it seems highly probable that many of them would succeed.†

"With regard to the degrees of heat, a pretty accurate judgment might be formed by a comparison of thermometrical observations that have been made in both countries; and the period when the grapes would attain maturity here, might be calculated from the periods of harvest, and the fall of the leaf from deciduous trees that are common to both countries. If in any two districts, the one in Europe, the other in America, the wheat harvest is at the same season of the year, the fall of the leaf at the same period, and the extremes of cold and heat are nearly alike, it can be hardly doubted, that if wine is made in one of those countries, it might be produced from the same grape in the other.

"These rules are capable of very extensive application; and if they are correct, we might, without wasting years in uncertain experiments, calculate in the first instance, with a great degree of accuracy, whether any particular grape would be suited to our climate or not. Perhaps in the more southern parts of the United States it would be difficult to apply them, as it may happen that in all the wine countries of Europe, whose winters are equally severe, the harvest is gathered at a later period, and the autumn comes on sooner. Such, I am inclined to believe, is the case; indeed, I am persuaded that the great warmth of our summers is much more unfavorable to the cultivation of the vine, than the winter's cold; and, of course, that some of the more northerly districts are much more suited to it, than those furthest south. Wine, I believe, is never made within the tropics. In Europe, Indian corn is found to require a warmer climate than the vine,‡ and there are few, if any districts in this country, where some of the varieties of that grain will not come to perfection. Most probably the winter of a large portion of the eastern states would be found too severe for most kinds of the vine. Were I, upon conjecture, to fix upon a spot for an experiment, I should look for it in those parts of the United States least subject to the extremes of heat as well as cold. The country south of the lakes Erie and Ontario, and the mountainous district that separates the eastern waters from those that fall into the Mississippi, in Pennsylvania, Maryland, Virginia, and perhaps the Carolinas, probably would be found to offer the most favorable situations for this purpose; but this can be determined by experience alone. Perhaps the experiment has already been made, under the circumstances I have ventured to recommend, and without success; but I cannot learn that it has ever been done; and if, in the first instance, it should fail, it ought not to be given up as hopeless, until a great number of trials are made with different kinds of vines, such as are most esteemed in the countries from which they are brought, and are most likely to suit our climate.§

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* See Legaux's Table of Vegetation in Pennsylvania, compared with that of some of the most famous wine countries in Europe. M'Mahon's Gardener's Calendar, p. 480, extracted, I believe, from some periodical work.

* See Young's Travels in France, and his map of the climate of France, annexed to that work.

† Since the above was prepared for the press, I have seen in the National Intelligencer, an account of some attempts to cultivate Hungarian vines in Maryland, near Hagerstown, which are said to have succeeded.

‡ Young's map of the climate of France, in which the northern limit of the climate fit for the cultivation of maize is placed about two degrees further south, than that of vines; both of them extending from the coast to the interior, in a north-easterly direction.

§ Nullum genus vitium conserendum est nisi fama, nullum diutius conservandum nisi experimento probatum. Columella, l. xvi. iii. Sec. 2.

"It may be supposed that the improvement of our native grape would be a shorter and more certain process; but all the kinds I have met with, have such harsh and crude juices, that I apprehend they cannot be improved, so as to become equal to the cultivated grape, for ages. The wild crab-apple is understood to be the original stock of all the fine varieties of that fruit of which we are now in possession. Cultivation, no doubt, has done much in the course of thousands of years; but most probably the greatest improvement has been effected by repeated selections of the best accidental varieties from seed, until they have been brought to their present improved state. In as long a course of time, possibly sooner, the native grape might be brought to the same state of perfection; but as all our cultivated apples are from European stocks, and no improvement from the native crab has hitherto been effected, it seems reasonable to expect, that if we look for equal success with the vine, we must pursue the same course."—pp. 29—33.

Though twenty-seven years have elapsed since the first publication of the foregoing passage, during which many persons have attempted vine culture and wine making, but little success, in general, has yet been met with, and we are but little better informed as to the causes of failure. While allowing much weight to the opinion of our author, as to the agency of climate in causing these different results in Europe and the United States, we also think there is much more in the differences of soils, than he supposes. It is true that vines are cultivated, and wine made profitably, on soils of various kinds in Europe. But it is believed that the best vineyards of Europe are generally, if not universally, more or less calcareous—while the soils of the eastern slope of the United States, have been recently found to be almost entirely destitute of calcareous earth—and probably, not an acre, or a rood, of vineyard, has been made artificially calcareous.

The cultivation of rice is next remarked upon—a crop which has been since abandoned in Virginia.

"Among other objects of cultivation that might be introduced or extended among us, we may, perhaps, reckon rice. This most valuable grain, which yields a greater supply of food from a given extent of ground than any other, is found, like Indian corn, to require a greater degree and longer duration of heat, than is afforded by the climate of the more northern parts of Europe; and, unlike that plant, it does not run freely into varieties, or readily accommodate itself to short summers. On the sunken grounds of the Chesapeake and its tributary streams, and perhaps the Delaware, are large tracts, that in soil and situation are well fitted to the cultivation of this plant. That the heat of summer is sufficiently great, there can be no question; the only doubt is, whether its duration is long enough. The kind that is cultivated in Carolina, is found not to ripen sufficiently early; it is, however, far from improbable, that in other parts of the globe, varieties of this grain might be found that would attain maturity sooner. Rice is said to be cultivated extensively on the banks of the Po, at no great distance from its source; a climate, the medium temperature of which I should think not materially different from that of the lower country of Virginia and Maryland. It is also said to have been lately introduced into Hungary,* the climate of which probably approaches still nearer to that of those parts of the United States. Whether it is cultivated so far to the north in China, I have not learned; if it be, it can hardly be doubted, that it would succeed equally well in the same parallels of latitude in the maritime parts of the United States.

"The similarity of climate between the United States and those parts of China that are in the same latitudes, has long since been remarked; and there is certainly no part of Europe, whose climate so nearly resembles our own. Unfortunately, our intercourse with that country is limited to a single port, and that further south than any part of the United States. If a free communication is ever established between our country and the more northern districts of China, it may probably be the means of introducing among us many plants of great utility, and which, being transplanted from a climate so like our own, would at once become naturalized to it."—pp. 33, 34.

However similar the geographical situation of China to the United States—there is, in respect to the grain spoken of above, a striking difference—for we are informed by Malte-Brun, that rice is the principal object of cultivation in China, except places in the north-west, which are too cold and dry for this crop—which is, therefore, replaced by wheat—(see Malte-Brun's Geography—book 42. page 560, Article, *China*—) whereas, we know that the production of rice in the United States is confined to very narrow limits, being hardly heard of out of South Carolina, and there restricted to certain peculiar localities.

Malte-Brun, on the page preceding the one just referred to, says, "the northern and western parts of China have a far colder climate than the countries of Europe, which are situated in the same parallel of latitude. The elevation of the land, and the snows with which, for the greater part of the year, the central mountains of Asia are covered, contribute to produce this difference of temperature."

"The extremes of heat and of cold are much greater at Pekin, than at Madrid, though the latitude is much the same; it freezes daily in December, January and February, and very often in March and November—the cold is often followed by excessive heat. At Pekin, there are, properly speaking, only two seasons, winter and summer. Calculating according to the observations of Father Amyot, the mean temperature of the greatest heat, is 121°; that of the greatest cold, 63° below zero; the medium heat of the year, 55°." This authority then, confirms the facts stated by the essayist—but does not attribute this extreme mutability of the climate, to the prevalence of the westerly winds. It is stated by Dr. Drake of Cincinnati, that the mean temperature of Philadelphia, is 53° 20′, which corresponds very nearly with that of Pekin. China produces, besides rice, which is the principal food of its vast population, wheat, cotton, sugar, indigo and tea, which last, however, prospers only between the parallels of 30° and 23°. Silk is also made in China—the silk-worms seeming to be indigenous in that country. China boasts also, the camphor tree—the paper mulberry—the tallow tree—*croton sebiferum*—the aloe, the heart of which sells for its weight in gold—and the useful bamboo—the lemon—three varieties of the orange—one of which, is of the size of a cherry—the Chinese chestnut—the banana—tamarind and guava. The Chinese pay little attention to making wine, though several provinces abound in grapes. Not far from Nankin, grows the red cotton, of which nankeen is made. The fibre is of a delicate pinkish orange, which it preserves, after it is spun and woven.

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* Miller's Gardener's Dictionary, Martyn's edit. art. ORYZA.

If the productions of one country, resemble another, we may infer, that they enjoy the same climate—and *vice versa*, if a similarity of climate be established between two countries, we may infer, that the productions of one, may be raised in the other. Latitude is an uncertain criterion, for in South America, the traveller finds summer at the base, and winter on the summit of the Andes.

Can any reader of the Register, refer us to the best maps of climate—charts of vegetable production? And here I will suggest the propriety of establishing a botanical garden in Virginia—an institution worthy of the attention of the state.

After the last quoted passage, the essayist continues:

"On the other hand, a due attention to the effect of our climate on some plants brought from Europe, might, perhaps, induce us to abandon the cultivation of them in the more southern districts of the United States. The common oat is a grain little suited to a warm climate; accordingly it is hardly known as an object of husbandry in the more southern countries of Europe. In America, while the northern states and the mountainous districts of the south, yield a grain that well repays the labor of the husbandman, that which is produced in the flat country of the southern states, as has been remarked by an intelligent English traveller,* is so light, that it hardly seems to possess the principle of vegetation; yet still, for the want of a proper substitute, it is cultivated throughout that range of country, whether to advantage or not, is at least doubtful. In a country destitute of meadows, an oat crop may serve as a substitute for hay.

"These instances are put by way of example. An examination of this subject in detail, would be foreign from the object of this inquiry; but I hope these unconnected hints may induce persons of more ability, and better means of information, to go more largely into it.

"Agriculture, like other arts, must depend for its advancement on experiments; but when these experiments are conducted on just principles, and in conformity to a correct theory, the road to improvement may be much shortened, and the labor and expense of attempts that cannot be expected to succeed, will frequently be avoided.

"By a due attention to the rules I have mentioned, and others that will readily occur to a reflecting mind, I am persuaded there is hardly a tree or a plant which belongs to any part of the old continent within the temperate zones, that might not be naturalized in some parts of the United States, and that without the waste of time or labor in a succession of fruitless experiments.

"It may be thought, that as our climate is subject to greater extremes than that of Europe, the country is not capable of producing some plants that flourish there. This, no doubt, is true, as to a large portion of the United States, with respect to some trees and perennial plants; but those vegetables that are useful to man, are, the greater part of them, annual, and, for their production, I am inclined to think our climate has the advantage of the more temperate one of Europe. Indian corn, a grain second in utility only to wheat, if it be second, requires a degree of warmth, that in Europe is only found in the more southern regions. In every part of the United States, from north to south, it is cultivated with success.

"Cotton, a plant of such extensive use, which flourishes to so great a degree throughout nearly or quite one-half the extent of our country, is only known as an object of cultivation in some small districts in the southern parts of Europe.

"The near resemblance between the climate of the United States and China has been already mentioned; perhaps no two countries on the face of the globe are more alike in this respect. That climate certainly cannot be thought a bad one, which of all others has been found most favorable to human life, and the richest in vegetable productions."—pp. 34—36.

The respective advantages of climate of our Atlantic states, and western Europe, are summed up and compared in the following impressive manner:

"Unfavorable comparisons of the climate of the United States with that of the western countries of Europe, in regard to the greater extremes of heat and cold, and more frequent and sudden varieties of weather in the former, are often made by Europeans, and, in some respects, perhaps not wholly without foundation; but I doubt whether the balance of advantages, if it be really in favor of Europe, is so in any very considerable degree. Some countries in Europe itself are much more subject to these extremes than others, and yet the inhabitants of the former are not inferior to those of the latter in health, bodily strength, or longevity. As has been observed in this essay, the thermometer has a much wider range in the eastern parts of France than the western, yet I believe that the native inhabitants of Brittany and Poitou, have never been thought superior in corporeal or mental qualities to those of Burgundy and Champaigne. The winters of the south of Germany, especially the more eastern part, are much more severe, and the heat of the summer greater than on the Atlantic coast in the same latitudes, yet the inhabitants of the former are as robust and long-lived as those of other countries in Europe. The changes of temperature to which our climate is subject, are seldom, if ever so sudden, as most persons engaged in active life go through daily, without injury, in winter and summer, in exchanging the temperate warmth of an apartment, for the open air. Our domestic animals average fairly with those of Europe. With respect to vegetable life, it is true, that the greater cold of winter deprives us of various useful trees and perennial plants that flourish in more northern latitudes in Europe; but, on the other hand, the greater heat of summer enables us to cultivate with success many valuable annuals, that cannot be brought to maturity in the north or middle of Europe. The cotton plant and Indian corn, both of inestimable value, are cultivated on a large scale, and are an abundant source of wealth and comfort, the former throughout an extensive region, comprehending the greater part of the southern states, and the latter in the whole extent of our country.

"In one point of comparison, I think our climate has the advantage of that of the more northern and western parts of Europe. The westerly winds, which carry with them the mild temperature of the Atlantic, are loaded with its vapors; and while we enjoy bright skies, and a clear, elastic air, for the greater part of the year, those countries, for much longer and more frequent periods, are enveloped in fogs, or obscured by clouds. This state of weather is not wholly without its advantages, but, on the whole, the balance seems to me, in this respect, in our favor.

"There is, however, one aspect in which the climate of a considerable portion of the territory of the United States may, perhaps, appear less favorable to Europeans, than that of any very great extent of country in the more temperate parts of Europe. Flat countries, intersected with stagnant waters, or sluggish streams, in hot or temperate climates, are almost uniformly less healthy than high lands, through which the water-courses pass with greater rapidity; and the comparative unhealthiness goes on increasing, with the distance from the poles. The southern coasts of Europe, from the Pyrenees along the Atlantic shores of Spain and Portugal to Gibraltar, and from Gibraltar to the Bosphorus, are generally mountainous, while the more northern countries bordering on the German sea, and on the southern shores of the Baltic, from Calais to St. Petersburgh, are uniformly low and level. If in the formation of these regions the northern had been mountainous, and the southern flat and intersected with sluggish waters, it seems highly probable that the southern would have been comparatively more unhealthy than they now are.

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* Mr. Strickland's communication to the Board of Agriculture.

"The sea coast of the United States is generally hilly, from Maine to New York. Further south is a belt of level land, narrower at the north, but increasing in breadth towards the south, until it forms a great extent of country, comprehending the whole maritime part of the southern states, from Maryland to the western limits of Louisiana, to which may be added, the southern part of the basin of the Mississippi, and its tributary streams. In this tract of country, as extensive as some of the larger kingdoms of Europe, though there are many districts that are far from being very unhealthy, the climate in general is thought less favorable to the European races of men, than that of the northern states, or the hilly country in the same latitudes, between the Mississippi and the Atlantic. To what cause is it owing, that the soil of this great tract of country is mostly cultivated by slaves, the descendants of those formerly imported from the coast of Guinea? And how does it happen, that their number, in comparison with that of the whites, goes on in an increasing ratio from north to south? Does this proceed from moral or physical causes, or from both combined? That the former have contributed to the introduction of slaves from Africa into our southern country, seems unquestionable. The products of this region, the tobacco of Maryland, Virginia, and North Carolina, and the rice of South Carolina and Georgia, meeting a ready market and good prices in Europe, occasioned a great and increasing demand for labor, and in later times, the successful cultivation of cotton, which has now become by far the most considerable product for exportation in the United States, has added greatly to that demand. Further to the north, the chief products of agriculture being either unsuited to transportation by sea, or like those of Europe, they have been less sought after abroad. Is it owing to this diversity, that while African slaves were freely admitted into all the English colonies, very few were received in the northern, while they were readily bought up in all the southern maritime country, where, to this day, almost the whole field labor is performed by their descendants? Or is this diversity owing, in part, to the difference of climate I have referred to?"—pp. 42, 44.

How much more dignified and useful, for our distinguished professional men of Virginia, (and the supposed author of this essay is one of the most distinguished,) to occupy their leisure in lucubrations of this kind, than in party squabbles and political wrangling—the petty intrigues of elections, and the scurrilous animosity of newspapers.

From the Richmond Enquirer.

PROCEEDINGS OF THE STOCKHOLDERS OF THE JAMES RIVER AND KANAWHA COMPANY.

The second annual meeting of the James River and Kanawha Company, convened at the Capitol in Richmond, on Monday, the 12th instant, and was organized by the appointment of Judge Summers of Kanawha, as chairman.

The proceedings commenced with the reading of the second annual report of the president of the company to the stockholders, of which the following is a sketch.

The operations and conditions of the company are stated under eight different heads.

I. *Change of officers and engineers.*—On the 20th January last, Mr. Samuel Marx resigned his seat in the Board of Directors, and the vacancy was filled by the appointment of Mr. Charles Ellis, of Richmond. On the 23rd of the same month, Mr. Randolph Harrison, senr., resigned his seat, and his place was supplied by Mr. Thomas M. Bondurant, of Buckingham.

On the 20th of February, Judge Wright resigned the office of chief engineer, on the ground of inability, from advancing age and bodily infirmity, to perform the active duties on so extesive a line of improvement. Mr. Charles Ellett, jr. was appointed his successor. The board desiring to avail itself of Judge Wright's skill and experience, appointed him consulting engineer, with the stipulation that he should visit the work at least once every quarter.

Mr. Simon W. Wright, resigned the office of principal assistant engineer, on the 26th of March. Mr. Daniel Livermore, was at this period, the only principal assistant in the service of the company. The board, with a view to make adequate provision for the wants of the new line, and for the survey of the old canal, authorized the president and chief engineer to appoint four additional principal assistants, and to make suitable modifications of the three original principal sections in the first division of the canal. Three of the places were filled by the appointment of Wm. Beckwith, John Couty, and Thomas De Witt. The great demand for engineers in the United States, put it out of the power of the board, to fill the remaining place with a suitable person. In the month of May, Mr. Livermore, from indisposition, resigned his office, and as no suitable successor could be obtained, the corps was reduced to the three principal assistants. This rendered it necessary to defer the contemplated survey of the old canal, and to employ two of the three principal assistants on the sixty miles next above Maiden's Adventure, and the third, on the next twenty miles below Lynchburg; and to confide the intermediate forty miles of the new line of canal, to the resident engineers, operating under the immediate instructions of the chief engineer.

Additions were made to the number of resident engineers, and of first and second rod-men, as they were required for the preparation of the line for assessment of damages, and for laying out and superintending the construction of the work.

The corps of engineers now consist of one chief engineer, one consulting engineer, three principal assistants, eleven resident engineers, eight rod-men of the first grade, thirteen rod-men of the second grade, two draftsmen, and one surveyor. It is contemplated in the course of the winter, to make further additions to the corps; so that in the spring, it will consist of one chief engineer, one consulting engineer, five principal assistants, fourteen resident engineers, fourteen rod-men of the first grade, fourteen rod-men of the second grade, and two draftsmen.

II. *Conclusion of the location of the first division of the canal.*—At the last report, the parts of the line extending from Scottsville to the Seven Islands, and from Columbia to Maiden's Adventure—in all, forty-seven miles, remained to be definitely located. The operations on these parts of the line, were necessarily interrupted by the winter season, and another cause of delay arose from the casual removal of the stakes, indicating the preliminary location. From Columbia to Maiden's Adventure, the line required almost entire re-location. These parts of the seventy-three miles advertised for contract, in the month of December, 1835, and not let, required frequent renewals of the stakes; thus giving rise to much labor and loss of time to the engineers. From these causes, the work of location was much protracted. On the 22nd July, the chief engineer announced that the line was in readiness for reception, and after examination by a committee of the directors, it was approved at the August meeting of the board.

In the location of the canal, a leading object with the board of directors was, to have it raised beyond the reach of danger from floods in the rivers; and with this view the freshet of 1814, the greatest since 1795, was selected as furnishing a proper standard for the elevation of the line. The freshet in June last, afforded satisfactory proof of the skill exhibited by the engineers in this part of the work. At Lynchburg and Warminster, and for some distance above and below those places, the freshet of June was somewhat higher than that of 1814; but at no point on this part of the line did the water of the river come within two feet of the top of the embankment. From Scottsville to Richmond, the June freshet was relatively lower; insomuch, that at Columbia and Cartersville, it was four feet below that of 1814; but the chief engineer has ascertained, that in this part of the line also, such a flood as that of 1814, would not have reached the level of the tow-path called for by the location, except at a point on the estate of Wm. Galt, in Fluvanna, and there the embankment will be raised so as to guard against the overflow of the waters in future time.

III. *Assessment of damages.*—The preparation of the line for assessment of damages, necessarily awaited the action of the legislature on the bill to allow an increased breadth of ground for the canal, and a change in the mode of assessment. This bill passed on the 19th of March, and measures were immediately adopted, with a view to the speedy execution of the law. Surveys were immediately commenced to prepare for assessment the seventy-three miles advertised for contract in December, and to complete the location, and prepare the remaining forty-seven miles of the first division of the line. To make the surveys, maps, and annexed descriptions, necessary for this purpose, required much time. On the 2nd of May, the Board of Public Works were informed that the part of the line, under contract, would be ready for assessment in June. That board having completed the appointment of assessors, were, on the 29th of May, notified that the necessary preparations for the assessment would be made by the middle of June, and were requested to communicate that fact to the assessors, and invite them to assemble at Lynchburg, on the 22d of that month. A full meeting of the assessors was defeated by several resignations in that body. Three of the assessors met at Lynchburg on the 22d of June, and being unwilling to enter on the discharge of their duties, in the absence of their colleagues, adjourned to meet at New Market, on the 6th of July. On the 7th of July, they formed a board, and commenced the performance of their duties. They proceeded as far as the mouth of Rockfish—and finding their view of the lands obstructed by the crops, and the season unfavorable to the discharge of their duties, they adjourned to meet in Lynchburg, on the 1st of October. During the recess of the board of assessors, the whole line was prepared for assessment. On the 4th of October, a full board having been formed, the assessors commenced their examination of the lands at the water-works above Lynchburg, and continuing it through the estates for one hundred and twenty miles, reached the end of the line at Maiden's Adventure, on the 1st of November. They then adjourned to Richmond, and completed their assessments on the 25th of November. The decision of the number of bridges to be allowed, was reserved to the committee of the board of directors; and they have allowed on the line from Lynchburg to Maiden's Adventure, 15 road bridges, 83 farm bridges, and 4 pivot boats.

The whole amount of assessments, including costs of serving notices, counsel fees, pay of assessors, &c. &c., is $162,488 48; which makes the cost per mile, $1354 05. In this sum, the cost of additional fences rendered necessary by the canal, is embraced, and it constitutes a heavy item of the account.

IV. *Amount of contracts, and progress of construction.*—The line from Maiden's Adventure to Lynchburg, was divided into 201 sections, each forming the subject of a separate contract—each contractor to take one or more contracts, as the parties might agree. The contracts on these sections, embrace the grubbing, excavation, embankment, puddling and external walling. The result of the whole lettings is, that of the 201 sections, 161, embracing all of the most heavy and difficult parts of the line, are at this time under contract, and that 40 sections, consisting of light and easy work, are still to be disposed of.

Of the masonry, 10 locks, 21 culverts, the Rivanna aqueduct, two lock houses, and the water-works' dam at Lynchburg, are under contract. Except the dam at Lynchburg, the dams are reserved to as late a day as possible, to lessen the period of interruption to the existing navigation upon the river.

The force employed upon the line of new canal, in the month of October, was 985 men, and 286 horses. In the month of November, it was 1,356 men, and 381 horses.

The work of excavation, &c. has been retarded by the great rise in the price of labor, the inadequate supply of contractors and other causes. Some of these causes have ceased to exist, and the effect of others is diminished. From present appearances, it is believed, that by the 1st of April, the whole of the remaining 40 sections will be under contract. Contracts for the masonry have been delayed, in part, by the same causes that delayed the execution of the excavation; but principally by the insufficient supply of stone-cutters and masons. These causes, it is believed, will, in great measure, be removed, and all the masonry be got under contract in the spring.

V. ***Preparations for the works of art, and discovery of hydraulic cement on the line of the canal.***—Since the last report, the agent employed to examine quarries, has completed his exploration of the country, in the vicinity of the canal. The result is, the discovery of about 30 quarries of suitable stone, and conveniently located, between Maiden's Adventure and the Seven Islands. Between the Seven Islands and Tye River, the quantity is deficient for locks, except at the upper end. Between Tye River and Lynchburg, there is a competent supply. The defective parts of the line can be supplied from quarries on the river. In no part of the line will the transportation be more than 16 miles, and that by water. On the Chesapeake and Ohio Canal, it is stated, that a large part of the stone used in the construction of locks was conveyed 32 miles.

The search for hydraulic lime was confided to Judge Kinsey of New Jersey, who was well recommended to the board as possessing the necessary skill and experience. He examined the country on the margin of the river from Rockfish, to the town of Covington. He found no hydraulic lime below the Blue Ridge; but above the Blue Ridge, he met with it at three points, viz: in the vicinity of the Natural Bridge, at Pattonsburg, and on the farm of William Allen, in Botetourt. It had been previously found on Mr. Edmondson's farm in Rockbridge, on the north branch of the river, and about seven miles above the head of the mountain canal. At Pattonsburg, Allen's, and Edmondson's, the lime is situated on the margin of the river. At the Natural Bridge, it is two or three miles distant. In all four places, it is abundant and of good quality. Its quality has been tested by experiments made by the agent and chief engineer; and the product of Edmondson's quarry has been subjected to chemical analysis by Professor Rogers.

The total cost of exploring the stone quarries and searching for water-proof lime, amounted to $2048 68. The policy of this expenditure is well justified by the tendency of the facts developed to lessen the cost of the masonry on the line.

In June, the board contracted with Messrs. Edmondson and Graham, to deliver 50,000 bushels of cement, at Edmondson's quarry, on the North River, at 25 cents per bushel. To this must be added the cost of the barrels, making the price 37½ cents at the landing, at the same time, the board contracted for 10,000 bushels of Rosendale cement, to be obtained from the State of New York. This was delivered on the bank of the basin, in Richmond, at 54 cents; making a difference at the points of delivery, of 17 cents in favor of the home article. Assuming the upward and downward freight to be the same, and the quantity used between Lynchburg and Maiden's Adventure to be 350,000, or 400,000 bushels, the saving to the company would be about $60,000. If the calculation be extended to embrace the entire line to Covington, the saving would not be less than $180,000.

With a view to hasten the works of art, and increase the supply of mechanics, the board has recently sent an agent to Scotland, to procure stone-cutters and masons from that country.

VI. *State and location of the old works.*—1st, *the Western Improvements and Kanawha River.*—These works were examined by the President and Mr. Caperton as a committee of the board in September. The road from Covington to the mouth of Big Sandy, together with the Guyandotte Turnpike, is 208 miles long. It had been dressed over in the course of the preceding season, and, as to ordinary repairs, was in excellent condition. In regard to *extraordinary* repairs, none were necessary from the falls to Guyandotte, except the bridges over Witcher's Creek, Mud River, and at Guyandotte, all of which required re-construction. The road from Covington to the falls, and the bridges thereon, required extraordinary repairs to a considerable extent.

In order to sustain and improve the road, the board at the commencement of the year, made liberal appropriations for the repair of bridges; and in addition thereto, authorized the annual expenditure of $6,000 for repairs and improvements for three years. The road was divided into six districts, and to each district was assigned a party of hands with the necessary tools and teams. The work has been vigorously prosecuted. The western division has been put in excellent condition, and much work has been done on the eastern division. The operations on this part of the line have been much retarded by the heavy rains and summer travel.

The height of the waters in the Kanawha River, has prevented effective operations there, during the past season. In the month of August, the hands were employed in preparing buoys, repairing the scraper-boats and cutting down timber, that hung over the stream; but early in September, they were discharged; there being no prospect of advantageous action for the residue of the season.

2nd. *The Blue Ridge Turnpike, the Blue Ridge Canal, and the dam and canal at Lynchburg.*—By the law authorizing the construction of the Blue Ridge Turnpike, this company was authorized to take the road when completed, by paying the amount expended, or transferring stock therefor. In January last, the board was informed that the road was completed, and had cost $9,258 80. They determined to take the road, and paid in scrip to the state on its new stock, 92 shares, and the residue of $58 80 in cash. A tariff of tolls was prescribed for the road, and it was put under the charge of the superintendent of the Blue Ridge Canal.

The Blue Ridge Canal was examined by the engineers at an early period of the year. On their report, the board concluded, that, with some increased repairs, it might answer the purposes of navigation, and its re-construction be delayed, until the new canal should reach that part of the line.

The flood in June, did material injury to this canal, and some damage to the works at Lynchburg. The damage at the mountain consisted in breaking the dams, sweeping away the bridge, and destroying between 700 and 800 yards of embankment. The loss at Lynchburg consisted in breaking the dam. This dam was insufficient, and would have been replaced by a new one, in the progress of the work. The board took immediate steps to repair the damage at Lynchburg and at the mountain. The expense of the repairs at the mountain was greatly increased, and the work delayed by the wetness of the season. The canal was opened for navigation within seven weeks after the arrival of the force sent to repair it.

The whole amount of expenditure in the mountain was $12,715 23, from which should be deducted $3,000, expended to adapt the work to the plan of the new improvement, leaving the real loss at the mountain $9,715 23. The real loss at Lynchburg, is $1,000, making in all $10,715 23.

3rd. *The lower canal from Maiden's Adventure to Richmond.*—This portion of the canal was so located, that at some points it was liable to be submerged, and sustained some damage from the freshets in June and August. From the statement of Mr. Richard Sampson, a director residing on the canal, and charged with an inquiry into the subject, the total amount of damage, inclusive of $285 worth of timber swept off, was $735.

In the month of May, preparations were made for a radical alteration of the Beaver Dam Aqueduct. A portion of the company's force was employed until the latter part of the month of August in providing materials. From the difficulty expected in the execution of the work in the ensuing months, it was postponed for another season.

The adjustment of the claims of the millers, &c. has been postponed until a general system for the sale and supply of water can be adopted.

Arrangements have been made for the immediate increase of the lower level of the canal, with a view to improve the navigation, and supply the increased demand for water power. The dimensions of this portion of the canal, will be equivalent to a cross section of 80 feet at the top of the water line, and 8 feet deep. The expense of the work will be enhanced by the necessity of excavating the additional breadth to the level of the water, before the water is drawn off. From a calculation of the chief engineer, the water that may be disposed of from this line, at present prices, would yield to the company an annual revenue of $120,000.

The dimensions of the residue of the lower line will not exceed the usual dimensions of the new canal. The survey of this portion of the work has been delayed for want of a suitable engineer; but the survey will be made, and the work re-constructed as speedily as circumstances will permit. A considerable portion of this work must be executed by the hands of the company. To ensure a sufficient force, an agent has been sent to some of the German States to procure laborers.

VII. *Fiscal concerns.*—On the 1st December, 1835, there was on hand, in the Bank of Virginia, a balance of revenue from the old improvements,

of	$5,873 07
And a balance on account of new improvements, of	90,144 78
Total,	$95,017 85
Three requisitions had been made on the stockholders, amounting to	$160,000 00
Of which had been paid	98,560 00
Leaving a balance due of	$61,440 00
In the year 1836, the receipts from capital stock, amounted to	344,368 88
To which, add balance on hand, on same account, at the commencement of the year,	90,144 78
Total,	$434,513 66
Disbursements on account of new improvements, during the year,	229,348 92
Leaving on hand, on the 1st inst., a balance of capital paid in, and applicable to new improvements, of	$205,164 74
Balance on hand from old improvements, after paying all charges thereon,	13,040 37
Total amount on hand,	218,205 11
In the year ending 30th November, 1836, five additional requisitions were made on the stockholders, making with the three preceding requisitions,	680,000 00
Of this sum, there were paid in prior to the 1st December instant,	442,672 00
Leaving due,	237,328 00

Two additional requisitions have been made on the stockholders, including the state, of $5 each, per share, payable on the 25th January, and 25th May, 1837.

The balance of $205,164 74, is subject to the immediate payment of the assessments, amounting to $158,656 50. Of the balance of $237,328 due from stockholders, $114,308 are due from individuals, and $123,020 from corporations—of which, $36,500 may be considered as payable promptly. The sum of $86,520 due from the city of Richmond, will not be paid until the determination of the suit now depending in the court of appeals, touching the validity of the subscription. This suit will probably be decided in January or February. The sum of $114,308 due from individuals, will no doubt be much reduced by remittances, for which the present season is favorable; but it may not be paid with sufficient certainty to prevent a failure of means to meet the engagements to contractors. The monthly payments to contractors through the winter, will be from $50,000 to $60,000. Authority to borrow such small sums as may be required to meet the contracts of the company, until the state's subscription shall be payable, was deemed necessary.

VIII. *Extension of the company's sphere of action and provisions amendatory of the act of incorporation.*—1st. The attention of the stockholders was called to the provisions in the charter of the Lynchburg and Tennessee Rail Road Company, giving this company a right, if they shall so elect, to construct a rail road from Richmond to Lynchburg.

2nd. The most expedient line of communication between the canal and tide-water, being found to pass through the Armory lot, belonging to the state, the location at that place, stands suspended until the pleasure of the legislature on the subject can be known.

3rd. The chief engineer having been requested to report upon the most advantageous mode of connection between the canal and tide-water, had proposed a ship canal between Manchester and Warwick, to be connected with the James River Line by means of a basin formed by a dam at the foot of the falls—a plan approved by Judge Wright, and ordered by the board of directors to be presented to the stockholders for their consideration. To carry it into execution, the grant (by legislative enactment,) to the company of additional powers, and the privilege of raising additional stock, would be necessary.

4th. The state of Maryland having within the last two years, authorized a subscription of eight millions of dollars, for the purpose of hastening her connection with the Ohio River, at the town of Wheeling, and the state of South Carolina, having in conjunction with other states on our southern border, commenced another line of connection with the Ohio, terminating below the mouth of the Kanawha River, the question was presented, whether it would not be expedient and proper for the company to request, and the state to grant an additional subscription, payable in a convenient term of years, upon the condition that the amount thereof should be expended exclusively in the construction of the company's rail road from Covington to the falls of Kanawha—the work to be commenced immediately.

In conclusion, the president bore testimony to the good conduct, attention and zeal of the officers and agents of the company, and especially to the improving condition of the corps of engineers.

Accompanying the report, were sundry resolutions proposed, giving authority, under specified restrictions, to the president and directors, to borrow money on the credit of the company, and directing memorials to be presented to the legislature, praying for leave to locate the canal across the Armory lot—for the additional powers, and the right to raise the additional capital, necessary to the execution of the plan of connection between the canal and tide-water, proposed in the report of the chief engineer above alluded to—and for an additional subscription from the state, to be applied to the immediate construction of the rail road from Covington to the falls of Kanawha.

Along with the report were presented a number of documents referred to therein, among which, were a copy of the assessments between Lynchburg and Maiden's Adventure, with accurate maps, surveys and descriptions of the land condemned; a copy of the charter of the Lynchburg and Tennessee Rail Road Company; a copy of the chief engineer's report on the survey for a ship canal from Richmond to Warwick, with a chart of the survey; the secretary's financial statements, &c.

The report, having been read, was, on motion, referred to a committee, consisting of Messrs. Chapman Johnson, Charles Yancey, Samuel McDowell Reid, Andrew Beirne, John Rutherfoord, Fleming James, John Wills and Lewis Summers, with instructions to inquire and report the measures which they deemed proper to be adopted.

The following preamble and resolutions submitted by Dr. Brockenbrough, were, on his motion, referred to the same committee, viz:

"Whereas, by the charter of the Lynchburg and Tennessee Rail Road Company, passed on the 11th March, 1836, it is made lawful for the James River and Kanawha Company, to construct a rail road from Richmond to Lynchburg, whenever the said rail road company "shall have commenced the construction of their road, pursuant to the provisions of the said charter;"—and, whereas, the said rail road company have not yet been organized—

"1. *Resolved by the stockholders of the James River and Kanawha Company*, That they now elect to construct said road from Richmond to Lynchburg, whenever the said Lynchburg and Tennessee Rail Road shall have been commenced.

"2. *Resolved*, That whenever the said Lynchburg and Tennessee Rail Road Company shall have commenced the construction of their rail road, the president and directors of the James River and Kanawha Company, be directed to open books of subscription for the purpose of raising the stock necessary to construct the said road from Richmond to Lynchburg, and that the necessary steps be taken to commence said road, whenever there is sufficient amount of stock taken to justify it.

"3. *Resolved*, That with the permission of the legislature, the company, in locating said road, will take such route to Lynchburg, after passing Willis' River, as may be deemed most practicable, on a complete survey of the different routes proposed, and an examination of the advantages and disadvantages of each."

The meeting then adjourned till 5 o'clock, P. M. on the next day, at the same place.

Tuesday, 13th December.

The meeting convened agreeably to adjournment; but on being informed that the committee above mentioned were not ready to report, adjourned till 5 o'clock, P. M. on the next day, at the same place.

Wednesday, 14th December.

The meeting having convened agreeably to adjournment, and called Mr. Wills to the Chair, the committee above mentioned, made a report, proposing for adoption the following resolutions, viz:

1. *Resolved*, That until the next annual meeting of the stockholders, the president and directors shall have authority to borrow money on the credit of the company, so far as they may deem it necessary to meet the engagements, and maintain the credit of the company; provided, that no loan or loans, negotiated under the authority of this resolution, shall severally, or in the aggregate, at any time, exceed the amount due and in arrear, from delinquent stockholders, upon requisitions previously made; and that no such loan shall be made payable after the 1st day of October next.

2. *Resolved*, That a committee of three be appointed with instructions to present to the general assembly, now in session, a suitable memorial, asking a modification of the charter of the company, in the following particulars, or in such of them, as to the wisdom of the legislature may seem expedient:

1st. Authorizing the location of the company's canal, through the lot of ground belonging to the state, on which the public armory stands, on such terms as may be deemed proper.

2nd. Granting to the company such additional powers, and authorizing them to raise such additional capital as may be necessary to the execution of the plan of connection between the tide-water and the canal, set forth in the chief engineer's report, communicated to the present meeting of the stockholders.

3rd. Making an additional subscription on behalf of the state to the stock of the company, to be applied to the immediate construction of the rail road from Covington to the western termination thereof.

4th. Authorizing the company in locating the rail road between Richmond and Lynchburg, after passing Willis's River, to take such route to Lynchburg, as they may deem best; provided, that if the main line of the road shall not pass by Scottsville, a lateral rail road shall be constructed connecting Scottsville with the main line.

5th. Authorizing the company to proceed in a summary way, by motion in court on ten days' notice, or by warrant before a justice of the peace, for sums not exceeding twenty dollars, to recover from delinquent stockholders the amount due from them to the company, and in arrear, upon requisitions regularly made, with legal interest thereon, from the time when such arrears respectively shall have fallen due, till paid, and costs—provided, however, that no such proceeding shall be had against any delinquent residing within the commonwealth, until thirty days' notice shall have been given, by advertisement stuck up at the door of the court-house of his county or corporation, on some court day. This authority to be used at the discretion of the company, either before or after they shall have sold the stock of the delinquent.

6th. Making such provisions as the president and directors of the company may recommend for more effectually collecting the tolls on the Kanawha River and the company's roads, and for regulating the tolls on those roads.

3. *Resolved*, That the president and directors be requested to cause the necessary examinations to be made, for ascertaining at what point below the falls of the Kanawha it will be most advantageous to connect the rail road with the navigation of that river; and that they be further requested to combine with their report to a future meeting of the stockholders, the considerations upon which the opinion of the board may be founded.

The Committee embraced in their report the two first resolutions offered by Dr. Brockenbrough and referred to them.

The resolutions, and members of resolutions, reported by the committee, were taken up separately in succession, and adopted—some of them after discussion, and the fifth member of the second resolution, after an unsuccessful motion for its amendment.

Messrs. Chapman Johnson, Richard Anderson and John H. Cocke, were appointed to constitute the committee called for by the second resolution above adopted.

The committee then proceeded to the election of officers for the ensuing year; whereupon, Joseph C. Cabell, Esq. was unanimously re-elected President, and Messrs. Sidney S. Baxter, Richard Sampson, John H. Cocke, John Early, Hugh Caperton, Charles Ellis and Thomas M. Bondurant, directors.

The following gentlemen were appointed a standing committee to examine the books, papers, finances, &c. of the company, viz: John Rutherfoord, Fleming James, Lewis Webb, Robert Gwathmey, Nicholas Mills, Francis B. Deane, jr. and David Anderson, jr.

The Secretary's salary was raised to $1750.

The meeting then adjourned *sine die*.

From the British Quarterly Journal of Agriculture.

EXTRACTS FROM A BIOGRAPHICAL MEMOIR OF SIR JOHN SINCLAIR.

[Continued from No. 8.]

In an essay like the present, we cannot overlook Sir John Sinclair's exertions to bring into public use the great discoveries in the art of draining land, made by Mr. Joseph Elkington, a Warwickshire farmer. Yet, although this system originated with that singular person, he was, in a great measure, unable to give to the world any very connected or distinct account of it; and, to obviate the difficulties arising from that circumstance, Sir John recommended Mr. John Johnstone, an intelligent land-surveyor, to the attention of the Board of Agriculture, as a gentleman amply qualified, not only to take plans of his different operations, but to give explanations of them.

Mr. Johnstone was accordingly nominated by the board, to accompany Mr. Elkington on a survey of the different drainages he had accomplished in several of the English counties, in order that a proper report might be drawn up of the principles on which his operations were founded, as well as practical details of the mode in which these were executed. The result was the publication of a systematic treatise on the theory and practice of draining land, which has become of standard influence on the subject of which it treats, and of which three editions have appeared—the first in 1797, the second in 1801, and the third last year, revised and enriched with so many valuable additions as almost to render it a new work.* In this way a complete account of Elkington's system was communicated to the public, and thousands enabled to put it into practice, who, for want of proper information, might long have remained ignorant alike of its principles, or their importance. To the credit of Sir John Sinclair it should also be told, that when, in 1799, the private affairs of Mr. Elkington had fallen into disorder, he endeavored to procure for him a parliamentary grant of £1000, in consideration of the benefits which his discoveries had conferred on agriculture. In this, after some exertion, he succeeded, and was in a great means the instrument of relieving the distresses of that ingenious and useful man.

It should also be remembered, that it was at the suggestion of Sir John, that the once overpraised, but now as much undervalued Dr. Darwin, the author of the Zoonomia, Botanic Garden, and Temple of Nature, was induced to undertake a work on practical agriculture. Nor can it be denied that the Phytologia, or Philosophy of Agriculture and Gardening—although, like the lectures of Sir Humphry Davy, of too abstract a description to be of general practical adaptation, abounds with useful observations and ingenious hints, whereof the recommendation of bone-dust as a manure should not be overlooked.† It was dedicated to Sir John in the following handsome terms:—"To Sir John Sinclair, President of the Board of Agriculture, by whose unremitted exertions such important improvements have been accomplished in the cultivation of the earth—that great source of life and felicity! This work, which was begun by his instigation, and forwarded by his encouragement, is dedicated with true respect, by his much obliged and obedient servant."*

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* The reader is particularly recommended to the perusal of Mr. Johstone's work in its improved state, as being the best and most complete work on the subject of draining, which has been yet given to the world. For a more detailed opinion on this subject, we need only refer to the Number of this Journal for September last, in which an attempt has been made to lay its merits before the public.

In a letter to Charles Gordon, Esq., Secretary to the Highland and Agricultural Society, dated January 10, 1835, Sir John Sinclair says, "I am very glad that Mr. John Johnstone, land-surveyor, has published another edition of his treatise on draining land. It is by far the best work on that subject that has ever been printed, and does great credit to the author's talents, and extensive knowledge of the subject. I hope, therefore, that the society will take copies of it, and will recommend it in the strongest manner to the attention, not only of its own members, but also to those societies at home and abroad with whom it is in correspondence."

† The first notice of the employment of bones as a manure was made in Dr. Hunter's Georgical Essays

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Sir John Sinclair thought, and with great propriety, that it might be set down as a maxim in literature, that "knowledge, previous to its being brought into a condensed state, may be compared to a small portion of gold, dispersed throughout a great quantity of ore. In that rude condition, the strongest man cannot sustain its weight, nor convey it to a distance; but when the pure metal is separated from the dross, a child may carry it without difficulty." Acting on this principle, he reduced the bulk of the Code of Health and Longevity, as we have just said, from four volumes to one, by condensing its details, and selecting its most valuable materials; and he then proceeded in the same way with the General Reports and the Statistical Account. In his view of the importance, nay necessity, of condensation, regarding art and science, implying by condensation the retaining only the more important facts and observations, and passing over those which either are of minor value, or are no longer useful, Sir John is ably borne out by Mr. Mill, the historian of India, who remarks, in his preface to that work, "that as no fact is more certain, so none is of more importance, in the science of human nature, than this—that the powers of observation, in every individual, are exceedingly limited; and that it is only by combining the observations of a number of individuals (or, in other words, forming codes regarding each important branch of science,) that a competent knowledge of any extensive subject can ever be acquired."

Proceeding in this spirit, Sir John set himself to digest the most valuable materials which had been given to the world on the subject of Agriculture, into one comprehensive volume. The English County Reports had been published in forty-seven octavo volumes, and those of Scotland amounted to thirty more. Seven volumes of communications, besides a number of other works on specific subjects, had also been published by the board. From these, and from the modern standard works on particular branches of the art, he picked out all the most valuable practical information, and where any topic appeared defective, he made every exertion to render it more perfect, by associating with experienced farmers, surveying their farms, and witnessing their most important operations on the spot. Thus armed, Sir John drew up his Code of Agriculture, the first edition of which was published in 1819. Three editions of it have been since given to the public of this country, besides another in America. It was also translated into the French, German, and Danish languages.

Long previous to this, however, it should be mentioned, that, in a letter to Sir John, Sir Joseph Banks had stated, "that an account of the systems of husbandry adopted in the more improved districts in Scotland, would be of the greatest advantage to the agricultural interests of the United Kingdom; and that it was incumbent upon a native of Scotlaad, while presiding at the Board of Agriculture, and possessing all the means of information which that situation afforded, to undertake the task. In objection, Sir John argued, that the labor of accomplishing such a task would be very great—that it would be extremely difficult to obtain the necessary information—and that it would afford an opportunity for cavillers to attack the board on the grounds of its promulgating doctrines which, if acted on, might prove ruinous to many farmers. But all obstacles vanished, when Sir John further urged, that agriculture has derived, is deriving, and will derive, more benefit from Scottish industry and skill, than has been accumulated since the days when Adam first wielded the spade." This occurred in 1809, but it was not till March 1812, that the whole mass of materials had been brought together. To do all justice to an undertaking so important, Sir John visited, in person, all those districts which were most celebrated for the cultivation both of strong and of light soils; and he afterwards circulated among the farmers whom he visited, a number of queries on rural subjects, requiring elucidation. By these means an immense mass of valuable matter was accumulated.

When, in 1793, the Board of Agriculture was constituted, the two great objects to which the attention of its members were primarily directed, were the general agricultural state of the country, and the means of improving that state. As the most effectual way of accomplishing this purpose, a number of qualified individuals were employed to draw up the district reports; and, as observed by a distinguished writer on husbandry, "in the course of little more than a year, the Board of Agriculture had printed a body of authentic facts respecting the agricultural and internal economy of this country, greater than was ever obtained by any other nation since the beginning of time." The collection of district reports having been accomplished, the board went a second time over the same ground, to have these reports consolidated into those of counties, and drawn up on a uniform and systematic plan.

This was the great object to which the attention of Sir John Sinclair was next directed, and in his address to the Board of Agriculture, on the 9th

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(vol. ii. p, 93,) and the discovery is attributed to Anthony St, Leger, Esq., a Yorkshire gentleman, so far back as 1766—another proof how long even the most important and valuable facts may be in arresting public attention. It was afterwards descanted on by Dr. Darwin, as we have just mentioned in the Phytologia (*vide* sect. 10,) and is briefly alluded to by Sir Humphry Davy in his lectures (page 252.) To the Doncaster Agricultural Association, however, belongs the merit of having collected the evidence on the subject, and of having decided on the great value of the discovery. This happened so recently as 1828, when the Association appointed a committee to make inquiries. The report was published by Ridgway, London, in 1829.

Sir John Sinclair immediately suggested, that the importation of bones should be encouraged by a public bounty, and that some allowance ought to be given to the captains of vessels, who brought home bones as ballast in their ships. For some years past the importation has become too profitable a speculation in commerce to require encouragement.

* *Vide* Phytologia, or the Philosophy of Agriculture and Gardening. 4to. London, 1800.

March 1813, he endeavored to explain the nature and advantages of making extensive inquiries the basis of condensed information. He then added, "that the power and prosperity of a country depend on the diffusion of useful knowledge, can hardly be questioned; and there is probably no art, in regard to which a variety of knowledge is of more essential importance, than in the art of agriculture. The extent of information necessary to bring it to any thing like perfection, is hardly to be credited. To preserve the fertility of the soil—to free it from superfluous moisture—to cultivate it to the greatest advantage—to raise its productions at the least expense—to procure the best instruments of husbandry—to select the stock likely to be the most profitable, to feed them in the most judicious manner, and to bring them to the most advantageous markets—to secure the harvest even in the most unpropitious seasons—to separate the grain from the straw with economy and success—and an endless variety of other particulars, require a degree of knowledge *to do them well*, of no common description."

From being in possession of the Statistical Account of Scotland, as well as of the County Reports, it was resolved to commence with that country, and Sir John, for the more entire completion of the task, associated with himself a committee of inspectors for revising the different great divisions of the work, consisting of Mr. Rennie of Phantassie, Mr. Robertson of Ladykirk, Mr. Low of Woodend, Mr. Walker of Wooden, Mr. Brown of Markle, Mr. Walker of Mellendean, Mr. Hunter of Glencarse, and the Rev. Charles Finlater of Newlands.

The grand divisions of this national work consisted of accounts of the geographical state and general circumstances of Scotland—of the landed property in Scotland—of buildings as connected with agriculture—and of the occupation of land in Scotland—together with dissertations on the implements of husbandry—on enclosing land, and the nature and advantages of fencing—and on the management of arable land.

The subsequent divisions of the work are devoted to the other branches of rural economy, after which a view is taken of the political economy of the nation, in which we are furnished with very interesting historical accounts of the various branches of our manufactures and commerce. In the volumes which constitute the appendix, a vast mine of information is opened up, regarding the civil and ecclesiastical divisions of Scotland.

On the appearance of the work, the Farming Club of Dalkeith, which consists of the principal agriculturists of the Lothians, Sir Joseph Banks, and upwards of fifty of the most eminent practical farmers in the kingdom, wrote to the author in terms of congratulation, and expressing their high estimate of its value.* As a work on the husbandry of Scotland could, however, only contain information applicable to districts similar in soil and climate, Sir John was then induced to turn himself to the great object of forming "a Code or Digest of Agriculture," on principles of universal application, and suited to all future times. In this he has amply succeeded; and had Sir John Sinclair bequeathed nothing to posterity save that work, his name must have ever been classed among the signal benefactors to the human race.

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We have already given, at some length, an account of the origin of that great national establishment the Board of Agriculture; and we have clearly seen, not only that the idea of such an institution originated with Sir John Sinclair, but that he was mainly, almost solely instrumental, in maturing its plans, and carrying these into execution, when formed. The labor and fatigue thus caused, would soon have worn out common zeal, more especially as it was attended, not with emolument, but great annual pecuniary loss. It is also admitted, on all hands, that an enthusiasm inferior to that which Sir John Sinclair evinced, in the cause of the national prosperity generally, and in that of its agriculture in particular, must have allowed the establishment, even after it had been put in operation, to have speedily fallen to pieces, so many ramifications of its interests had to be attended to, and so many individuals consulted. It will scarcely be credited, therefore, that, after Sir John had presided over the Board of Agriculture with so much honor to himself, and with so much benefit to the nation, for a period of five years, an attempt should have been made, and that successfully, to deprive him of the president's chair. We have no wish here to investigate into the causes of this transaction, or the ways and means by which it was effected. We fear that, throughout the business, Mr. Pitt did not act with his accustomed openness and generosity of disposition, although we can scarcely permit ourselves to suppose, that any political differences of opinion between himself and Sir John should ever have been allowed to actuate his conduct. It is true that Sir John differed with the celebrated minister in opinion, with regard to the trial of Warren Hastings, the Westminster scrutiny, and, we believe, also the Irish propositions; and it has also been surmised by some, that Mr. Pitt was not only a little jealous of his influence and popularity on some important national topics, but considered him too independent in his parliamentary votes. Be this as it may, there can be little doubt, that, through the exertions of Mr. Pitt, an opponent was started against Sir John; and that, through his influence, the opposition was a successful one. Most of the official members of the board were prevailed upon to attend the election, although they had never taken any part in its proceedings before. The Archbishop of York was an honorable exception, and, although applied to, he would not vote against Sir John. To the great mortification of the regular members, Lord Sommerville, who had been prevailed upon, although it appears very reluctantly, to come forward, was elected—but only by a majority of one. Sir John himself very kindly apologizes for this not very courteous intrusion on the part of his lordship, by telling us, that Lord Sommerville had been informed, that if he did not come forward, some other candidate would be found, or that the board would be abolished. No unkindly feeling was generated in the breast of the ex-president regarding his conduct in the matter, nor was it allowed to interfere with the friendly intercourse which had formerly subsisted between them.

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* In an unpublished memorandum, Sir John states, that "the proprietors of land in the Lothians, and other improved districts of Scotland, reaped peculiar advantage from the attention that had been directed to the improvement and management of the soil, by the institution of the Board of Agriculture, an instance of which was given by the celebrated farmer Mr. Brown of Markle, in East Lothian, who, in a letter dated 5th January 1813, mentions, that a farm containing 330 Scotch acres of arable land, was just let for £2700 per annum, or at £8 2s. per Scotch, or £6 10s. per English acre, which he recollects in his early days did not pay above £300 per annum, while the occupiers were in a poor condition, and scarcely able to pay their landlord, at the usual term."

To the credit and honor of the board, be it recorded, however, that the first of its acts, under the new president, was the passing of a vote of thanks to the old, for "his great attention to the duties of his office, and for his great zeal to promote the objects of the institution." A public acknowledgment of services thus publicly rendered, could not fail of being universally considered honorable alike to those who bestowed, and to him who received it; and it must have been soothing to the feelings of Sir John Sinclair, allowing that they might have been somewhat wounded on the occasion, if added to this general expression of the board, he received from the first Marquis of Lansdowne, from Warren Hastings, and from Bishop Watson, as well as from its treasurer and secretary, letters expressive of their wonder and indignation at the whole proceeding.

Eight years after this unbecoming and untoward transaction, Sir John Sinclair was again installed in the chair, from which he should have never been unseated; and he continued to hold the situation of president of the Board of Agriculture till 1813, when the vast expense which its management personally involved, and which had considerably impaired his private fortune, obliged him to resign. Lord Macclesfield was president when the board was finally dissolved, and its papers sent to the Tower of London—where they may still be seen heaped together in the Record Office, a huge mass of information, which it cost an immensity of human labor and research to accumulate, probably for ever lost to the world.

Having mentioned the exertions made by Sir John Sinclair to render the discoveries of Elkington of public utility, by having Mr. Johnstone appointed by the board to report on his system, as also to obtain the parliamentary grant for that individual, which rendered his old age comfortable, we must not omit those in behoof of Andrew Meikle, the inventor of the thrashing machine—unquestionably the most valuable implement introduced into the practice of husbandry during the last hundred years. At the age of ninety-two, he was still alive and in great poverty; and it at once occurred to Sir John, that this opprobrium should instantly be removed by the nobility and landed interest, whom his discoveries had so much benefited. Mr. Meikle having been born, and still residing in East Lothian, he addressed a letter to the Earl of Haddington, as Lord Lieutenant of the county, earnestly recommending the subject to his attention. A general meeting of the proprietors and farmers was accordingly held on the 26th December 1809, and the measure met with unanimous approbation. The sum of £1-500 was thus raised; and the family of the unpretending old man, whose invention has been of so much benefit to the world, was thus rescued from the necessities which must have otherwise encompassed them for ever. Sir John had also the pleasure of raising a sum of money for the family of Mr. Small, who distinguished himself by his improvement on the construction of the Scotch plough.*

For the Farmer's Register.

SOME OBSERVATIONS ON CLOSE ROOMS.

Ward's Fork, Charlotte.

In a former essay I said something of the inconvenience of dust. I shall here speak of, perhaps, a more disagreeable intruder—impure air. I have often wondered how people could live at all in the air of as close apartments as our chambers. The whole family is frequently seen crowded together in a small room breathing the same air until it will scarcely support the flame of a tallow candle, much less the lamp of life. In such airless holes, life languishes, health declines, the mind grows feeble and dispirited, and the complexion grows pale and sickly, and the poor nervous inhabitant becomes unfit for any part of domestic business, or for the social scene: and what is most remarkable, that there is a notion among some folks, who have certainly mistaken the thing, that a florid color is a mark of vulgarity. Look around you, and pray who are the people that carry the most of the ghostly visage and sallow complexions? Are they not the half-fed, half-clothed, and half-aired inhabitants of close cabins, cellar rooms, and factories, and prisons, which are mostly deprived of pure air, which reddens and invigorates the blood? How this prison-house complexion ever should have been admired, and thought genteel, I am at a loss to tell. 'Tis true, I have seen some well bred genteel people with this color, who have stewed themselves down to it in close hot rooms, under a notion that it adds to a desirable delicacy, and removes a masculine coarseness. But this is certainly a wide mistake.

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Nothing purifies and clears the skin as much as pure air and fresh spring water. Do you wish for a beautiful complexion? Use nature's paint. Do you wish to be sweet? Take your perfumes from her dressing box, and washes from her bottles. Do you wish to be fair? Inhale the pure air of the morning. Nothing beside can impart the delicate tints. No color has been so much celebrated by the poets as the clear white and red mingled. The white gotten from close rooms is a dull, not a clear white—not a fresh, but a sickly hue—not attracting, but forbidding. The perfect complexion is the red of the rose delicately blended with the white of the lilly. This is nature's best painting, and I will venture to say, excludes any idea of vulgarity. Some ladies, strange to tell, after having procured the pale color by confinement in close rooms, have been caught with artificial paint on their cheeks. This shows the secret preference to the rosy cheek. But here again, in this sort of flesh coloring, they miss their object: this is daubing, not painting. Nature is the only painter in this case. She alone can mingle aright the delicate shades of the "human face divine."

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* For a very interesting biographical account of James Small, and of his improvements in making instruments of husbandry, *vide* General Report of Scotland, vol. iv. Appendix, p. 352-9.

Besides the unhealthiness of close rooms, it is certainly quite ungenteel to take into our lungs air breathed over and over again by others. We think it so to wash in the same water and drink out of the same cup; but to take into our lungs air many times expelled from our neighbors', seems more so.

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Another inconvenience of unventilated rooms is, the limbs of the farmer are so relaxed by sleeping in such, that it greatly indisposes him to quit his bed at an early hour to attend to his business. When people lived in more open houses, they were more active, industrious and energetic. When the morning light broke in at the cracks, they broke out at their doors. These men rose early to wear out their lands: I wish their sons may rise early enough to restore them. I really believe the amount of energy that one has in any given time, depends more upon the pure fresh air that he inhales in that time than on any thing else—and one's future success in life greatly depends on the quantity of pure air he breathes in early life. The destinies of families and nations are, I think, much influenced by the construction of their houses. It is hard for me to believe that many great or useful men ever came out of air-proof houses. Hardy raising, I think, is indispensable to success in agricultural pursuits. Men brought up in a delicate way have not the energy of grasshoppers. After the cock has crowed thrice, they are still soaking in bed. They shrink with horror at the approach of cold air. The room must be warmed by a log fire before they will venture to put on their breeches—and they must get two or three cups of strong coffee before they will venture to see about their stock if the weather is bad. And this indispensable attention to stock in bad weather is committed to whom? To an overseer who has no more concern for them than for those of the next neighbor. I have heard some of these love-sleep gentry exclaim on getting to bed, "blessed is the man that invented sleep." They might add more: "blessed is the man that invented overseers." For the idea of being relieved from the necessity of attending to business is far more grateful to their relaxed nerves than even sleep itself. You may talk about plaster of Paris, lime, marl, and stable manure, for exhausted soil—but all in vain—if there is not energy and industry, perseverance and firmness to apply them. It is physical energy and mental firmness, and they go together, that are wanting. It is not the want of ways and means, but the power of execution. The very name of a rail road, or steam boat, or a plaster mill, throw our men, with overseers and hot rooms, into fits of hypochondria. Much labor! too much labor! is the cry; and they shrink back from such mighty projects, saying "blessed is the man that invented sleep."

I. R.

CURE OF LOCK JAW.

Among the horses exhibited at the West Suffolk agricultural show, was a fine cart mare, the property of Colonel Rushbrook, which was some time since seized with locked jaw, and was perfectly cured by pouring cold water along the back from a watering pot, without intermission for a considerable time; the application being recommended by an eminent London veterinarian. This affection has been generally considered incurable.—*English paper.*

THE NECESSITY OF COLD ON SILK WORMS' EGGS BEFORE THEIR HATCHING.

To the Editor of the Farmers' Register.

Vicksburg, (Mi.) Nov. 29, 1836.

I perceive by an extract from a French author, in your No. 6, that it is considered an important desideratum to hatch the eggs of the silk worm the same year they are produced, so as to have a series of generations. Having paid but little attention to the business for several years, I had thought that the difficulty was long since overcome. I once raised a few from motives of curiosity, and wishing to have a second crop, like your French author, I tried animal heat, but to no purpose. In the following spring, the eggs hatched before the mulberry had put forth its leaves. The circumstance of their hatching at 70° in the spring after, withstanding the greater heat of the previous summer, induced me to reflect upon the subject. A little reflection convinced me that in their wild state, a series of generations must be produced in the same year—the last of which remains in the chrysalis state during the winter; that the eggs require to be chilled to a certain degree before they will hatch; that the night air, to which they are exposed in their wild state, is sufficient for the purpose. My curiosity having been fully gratified, I did not proceed to test the correctness of this idea: but if the night air is not sufficient, an artificial winter might easily be contrived—and the only wonder is, that so obvious a plan should never have been tried.

From the British Quarterly Journal of Agriculture.

SOME ACCOUNT OF FLEMISH HUSBANDRY.

By Alexander Thompson, Esq. Banchory House, Aberdeenshire.

I spent a few weeks, in the summer of 1835, in Belgium, and I then observed several agricultural practices which were new to me, and which appear worthy of consideration, if not of imitation, in our own country.

In various parts of Brabant, I saw, in all the various steps of its progress, a mode of bringing heath and moorland into cultivation, which, on inquiry, I found to have been long practised, and to a very great extent. The ground to be improved, generally not exceeding an acre at one time, and often much less, is planted with one year old seedling oaks, in rows one foot apart, and the same distance from plant to plant in the rows; these make annual shoots of at least twelve or fifteen inches with a proportional side growth. They are allowed to grow up untouched for five or six to eight or ten years, according to the progress they make. The annual fall of leaves enriches the soil, while the thick shade completely extirpates the heath and other wild plants. When the soil is supposed to be sufficiently ameliorated, the young trees are grubbed up, the stems are made into faggots and sold for firewood, and the leaves and small branches are burned on the spot and the ashes carefully spread on the soil where they act as a very stimulating manure. The ground is then ploughed and sown with a corn crop—generally oats, a regular rotation of cropping ensues, and thus the land is permanently reclaimed.

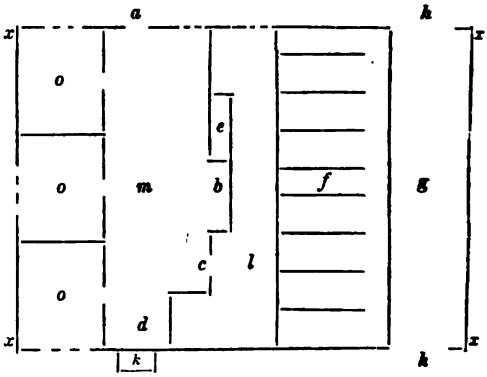
Those moors which I saw, looked very poor and unfertile. The heath was short and stunted, and where the soil was recently turned up, it looked as white as a newly limed field. In short, it seemed little better than pure sand, which, however, had the greasy feel peculiar to alluvial soils, and in some places there was a thin stratum of peat earth above the sand. The lately planted oaks looked exactly like nursery ground, and the older like very thick coppice, so that this mode of improving produces immediate beauty. A few of the trees of the outside rows are sometimes left to grow to timber, but too frequently the oaks are cut out to make room for willows and poplars, which afford a larger quantity of firewood. I could not get any distinct account of the expense of this mode of improvement; but, as firewood is very dear in Belgium, I should expect that the faggots sold would amply repay the price of the seedlings, and the expense of planting and grubbing them up. There is no other expense in the process, until the ploughing and sowing, which, of course, ought to be charged against the ensuing crop. I was informed that a large portion of what is now arable land in Brabant, was in the state of a barren moor, even within the memory of persons yet alive, and had been reclaimed in the manner now described.

There may be situations in Scotland far removed from supplies of manure where this process would succeed and pay. We all know the effect of larch plantations in extirpating heath, and producing good pasture, where little or none existed before.

The Belgian farmers are not contented with one good crop in the year; they contrive to have two from a considerable part of their land. Wheat and rye are sown in autumn; in February or March, carrot seeds are sown among the braird, and the best time for doing this is when the ground is covered with snow; when the snow melts, the seeds are carried down into the soil, and if there be no snow, the best time is during a heavy fall of rain. The carrots spring and grow under the grain. A wide toothed wooden harrow is drawn over the ground, which slightly stirs the soil and loosens the stubble. The latter is carefully pulled up with the hand and removed from the ground, and the carrots when necessary, are thinned. They grow rapidly after getting the ground to themselves, and produce a large supply of winter food. The objection which naturally occurs to this plan in any country, is, that it is too much for the soil to carry two crops at one time; but it must be noticed, that the corn crop draws its nourishment from the upper part of the soil, whilst the carrot roots pentrate much deeper and feed upon a lower stratum.

Turnips are sown after the cutting down of the grain crops, but the harvest is so early in Belgium that the stubble is ploughed in, and the turnip generally sown by the 15th or 20th July. All those I saw were broadcast. After corn, they also frequently sow spurry; a plant with us considered utterly unworthy of cultivation, but so much esteemed in Belgium that I found there is a law against exporting the seed.

The collection and preservation of manure is unquestionably the chief excellence of Belgian farming, and the subject on which we may derive most instruction from attending to these practices. When they have the means of procuring distillery refuse or any other liquid manure, they form small tanks for receiving it. These are built of brick, four or six together, about seven feet deep, and each division from six to ten feet long, and six or seven feet wide; when empty they are neatly whitewashed inside. I do not know why they are not rectangular, but I saw none which were so. All sorts of liquid manures are conveyed from the large towns by the rivers and canals to a considerable distance, and bring a large price. They are bestowed chiefly on the young brairds, or, as it was expressed to me, "the whole spring they are constantly watering their braird with liquid manure, driving carts, with barrels, across their fields in every direction, and showering it upon their young crops," that is, if they have a sufficient quantity of it, they go over all their corn crops repeatedly with it during spring. The effect of this must be very beneficial—but the farmer must and ought to depend principally on the produce of his own farm-yard for his manure, and it is here that the Belgian system is so admirable. The following sketch of the ordinary mode of arranging a house, will assist in understanding their mode of proceeding.



a, House-door. *b*, Large fire place, *c*, Door to Cow-house. *d*, Part of Kitchen devoted to churning, &c. *e*, Tank for distillery grains: this does not always occur. *f*, Stalls for cattle, very slightly divided. *g*, Dungpit. *h h*, Doors of Dungpit, wide enough to admit a cart. *k*, Dog-wheel for churning. *l*, Cowhouse, *m*, Large apartment for cooking, eating and working. *o o o*, Sleeping apartments. *x x x x*, Outer walls of house. The barns, stables, &c. are generally detached. The large space over the rooms and under the roof is used for keeping hemp, flax, &c. until they are dressed. The width of the whole may be from 40 to 50 feet.

It will be seen that the dwelling-house and cowhouse are contiguous. The kitchen or family room is a very large apartment, one end of it is appropriated to churning, &c., and on the side next the cowhouse is a very large fire-place, or hearth, in one corner of which, will invariably be found a fire and a large boiler over it. This is for preparing the liquid food for the cows, with which they are liberally supplied three times a day. It contains water, chaff, weeds of all sorts, nettles, &c. covered with a little rye, rape, or linseed meal, or mixed with distillery refuse. The butter-milk is also added and given back to the cows, and with so much liquid food, they are able to consume a great deal of straw in winter. Turnips and carrots seem to form but a small proportion of their food. In summer they have clover, and spurry in autumn when grown. A door adjoining the fire-place leads to the cow-house, and the liquid food is given in wooden troughs, kept clean and nice. Behind the cattle is the dungpit: this is excavated to the depth of six or eight feet, and is twelve or fourteen wide, into it they cast every sort of stuff; sweepings of roads, parings of ditches or banks, and dry earth. These being completely saturated with urine and mixed with droppings from the cattle, form admirable manure. Not being exposed, like an English straw-yard, to wind and rain, little or nothing is evaporated or lost. When the manure is required, it is taken out, and the pit again filled with earth, &c. It is of course not filled up to the level of the stalls, but space is left for the increase of the manure. The cattle are constantly in the house, except an hour or two in the morning in summer, and at noon in autumn, when they go to walk along the lanes. Field pasturing is unknown, and thus almost all the manure is deposited in the house, and even a large proportion of what falls out of doors is gathered up and collected in heaps by children. The quantity of manure thus collected is very great, and owing to the variety of their crops, the dungpits are emptied several times a year.

I think the Highland Society might with propriety offer a premium for experiments on the use of covered dungpits, and I have no doubt that if the practice were once introduced, the advantages would soon establish it universally. The Belgian cattle are certainly too much confined to the house, and part of their food seems more calculated to improve the dungpit than any thing else, and to this I attributed what appeared to me the inferior quality of all the products of the dairy; but this is a quite different question from the propriety of sheltering the manure, necessarily produced in a farm-yard, from the effects of the weather, whether it be sun, or wind, or rain.

The dogs in Belgium are obliged to take their share of the farm work, and relieve the dairy-maids from the labor of churning. A wheel is erected outside the house, and under a wooden cover, twelve to fourteen feet diameter, with a rim about fifteen inches broad. The dog is placed within the wheel, and moving forward, causes the wheel to go round exactly like a tread-mill, except that the dog is placed within, and the men outside the wheel. There are wooden teeth outside the wheel, which turns a smaller wheel, which again moves a double crank inside the house, to which the plungers of the churn are attached. There are generally three dogs kept for each churn, and they work each an hour at a time. They are made to go faster or slower by calling to them. At gentlemen's houses they were fat, and seemed to like their work well, but at the peasants' houses they were not so comfortable looking. On one occasion a dog who was ordered to work to show me the process, displayed the greatest reluctance, but on my noticing it, the peasant assured me it was only because he knew it was not his regular time.

The cultivation of flax forms a most important part of Belgian agriculture, but the subject is too extensive to be included in the present communication; perhaps I may ere long say something about it.

I think the following recipe for the cure of red water is worthy of being made public. I received it from a German friend, and it is the recipe of an old Pomeranian shepherd, who declared it *never* failed. I had it a considerable time in my possession, before I had an opportunity of trying it on a cow of my own; and until I had done so with success, I was unwilling to prescribe it among my neighbors lest it should prove fatal. It however cured a cow of mine, and I have since given it in above twenty cases, almost all among my own tenants, and with perfect success, except in two cases, when the animals were at the point of death before they got it. It is a mixture of equal parts of Oleum Philosophorum, Olerum Aspic, Oleum Terebinthum; sixty to seventy drops in half a quart of lukewarm water for a middle-sized cow, and from thirty to fifty for a calf, according to size. If it does not cure in twelve hours, repeat the dose. I have never known more than two doses required. The materials can be furnished by Baildon, successor to Butler and Co. 74 Prince's Street, Edinburgh.

From the Troy [N. Y.] Budget of January 2.

RECENT AND DISASTROUS LAND-SLIPS IN TROY.

Early last summer, many of our readers are aware, a large mass of clay burst from the hill on the east section of the first ward of this city, followed by a gushing stream of water, and doing no other injury than covering a large portion of ground at the base with the bowels of the hill. Last evening about 7 o'clock, a similar occurrence took place on the same spot, but, we regret to say, greater in extent, and *exceedingly fatal in its consequences.* An avalanche of clay came tumbling from an eminence of nearly 500 feet, moving down the base of the hill to level land, and then continued from the impulse it received, to the distance of about 800 feet, covering up acres of ground, accompanied with a cataract of water and sand which kept up a terrible roar. The mass moved along with great rapidity, carrying with it two stables and three dwelling houses, and crushing them and their contents in thousands of pieces. The stables and horses were moved to a distance of over 200 feet, into an hollow on the corner of Washington and Fourth streets.

In its way the avalanche also encountered a brick-kiln, burying it partially over and crumbling it together, from which a few minutes after the flames rushed forth and lit up the city as with a great conflagration. This signal was the first intimation that was had of the catastrophe, to those not in the immediate vicinity.

The three dwelling houses destroyed were of light structure, and are occupied by Mr. John Grace, another by Mrs. Leavensworth, and the third by Mrs. Warner, the last of which was fortunately vacant at the time of the calamity. In Grace's house was himself and wife and little boy. *The two former were extricated from the ruins dead*, and the boy was taken out alive, very little hurt, bare footed and bare headed, the buildings having been shattered in a thousand pieces—which is undoubtedly one of the most singular escapes that ever came to our knowledge. There were four of Mrs. Leavensworth's family in her house—herself and three children. Two of the children were in bed at the time, and probably asleep, and were afterwards taken from the midst of the wreck, dead, crushed almost to a jelly, and were undoubtedly thrown instantly from a natural sleep into a sleep of death. Mrs. Leavensworth was taken out shockingly bruised, and was barely alive when we last heard from her. Fortunately three of the family were at church at the time, and escaped awful deaths.

The stables were owned by Mr. Bingham, in which were 22 horses, and all carried along with the mass together, with nine or ten dirt carts. Six horses were taken from the ruins alive—the other sixteen were killed. The dead bodies of the horses can this morning be seen mingled among the ruins. Mr. Bingham's loss must be considerable.

We learn that the body of a person was found, name unknown, who was probably employed in the brick kiln or stables—which makes in all *five dead bodies* taken from the ruins last night. There are probably others buried among the ruins, as it is likely some persons at the time were in the stables or brick kiln.

The avalanche passed over a public highway which leads to the mill and nail factory, and might have carried along with it some straggling traveller. The clay is piled up in masses to the depth of from 10 to 40 feet over a large surface. It must have moved with great rapidity, and it is fortunate that it had not happened at the time when the laborers were employed in digging from the hill. At the time it was snowing freely, and this morning the scene was entirely covered with a white veil.

The scene that presented itself in the early part of the evening was awful in the highest degree. The horrors of an earthquake could not have presented a more dreadful spectacle. In the midst of a mass of convulsed earth, a multitude of human beings were moving to and fro—some carrying torches and others digging among the ruins, and dragging from the midst the remains of some lifeless body, or were rescuing some one in whom life had not yet become extinct—some were crying "ho! ropes, ropes!" "help," "shovels," &c. while the scene was dimly illuminated by the flames from the burning brick kiln, which is yet smouldering like an almost exhausted volcano. The scene must have been witnessed to be realized—we can give but a faint description of it.

Five large trees were precipitated from the hill, some of which are now standing erect at the bottom, and others in a slightly inclined posture. The whole is considered a singular phenomenon, and its immediate cause is the result of much speculation.

We have endeavored to give all the particulars that have come to our knowledge—in doing it in great haste, a few inaccuracies may have crept into our statement, but in the end it will be found generally correct.

From the [British] Northern Whig, October 1835.

A MOVING BOG.

This rather rare phenomenon has been lately witnessed on a part of Lord O'Neil's estate, in the neighborhood of Randalstown, on the Ballymena road and about two miles and a half from the former town. The following is the substance of a letter which we have received from a gentleman who was at the place on Saturday last:—"On the 19th ult., in the evening, the first movement occurred. A person who was near the ground was surprised to hear a sort of rumbling noise, as if under the earth; and immediately after, his surprise was not a little increased, on perceiving a part of the bog move pretty rapidly forward, a distance of a few perches. It then halted, and exhibited a broken, rugged appearance, with a soft peaty substance boiling up through the chinks. It remained in this state till the 22d, when it suddenly moved forward, at a quick rate, covering corn fields, potato fields, turf-stack, hay-ricks, &c. not a vestige of which now remains to be seen. So sudden and rapid was this movement, that the adjacent mail-coach road was covered, in a few minutes, or rather moments, to a depth of nearly twenty feet. It then directed its course towards the river Maine, which lay below it; and so great was its force, and such the quantity of matter carried along, that the moving mass was forced a considerable way across the river. In consequence of the late heavy rains, the river has again found its channel through the matter deposited in its bed, otherwise the water would have been forced back, and immense damage done to the land on the banks. The fish in the river have been killed to a great distance. The damage done by the mossy inundation has been very considerable. About 150 acres of excellent arable land have been covered, and rendered totally useless. Down the middle of this projected matter a channel has been formed, through which there is a continual flow of dark peaty substance, over ground where only two weeks ago the reapers were at work. A house close by the road is so far overwhelmed, that only a part of the roof is to be seen. Besides the actual damage sustained, the utmost alarm prevails and the people living adjacent to the place have been removing their furniture, &c to a distance. All manner of absurd reasons are assigned to account for the destroying visitation; but as the cause is one of a natural and sufficiently well ascertained kind, it is useless to dwell upon the solutions offered by ignorance."

From the Quarterly Journal of Agriculture.

ON THE CULTURE OF BRANK, OR BUCK-WHEAT.

By Mr. Main, Chelsea.

Notwithstanding this plant is probably a native of China and other warm climates, it may be cultivated in all the northern countries of Asia and Europe. This is owing to its being an annual of very quick growth, requiring only a summer of two or three months to bring it to perfection. It even ripens in the short summers of Siberia, and is considered exceedingly valuable on *poor light* *soils*, where the other more valuable cereals do not prosper.

In the north of Europe it is much used as an article of human diet, as well as food for all kinds of live stock. It yields a flour of remarkable whiteness, and, on the continent, is very commonly mixed with that of rye or wheat, by both public and private bakers. In England it is sometimes used by bakers and confectioners in the manufacture of their finest fancy articles; but never in common bread or other food. It has been malted and tried in the manufacture of beer, but the liquor, though palatable, is *dangerously* heady and unwholesome.

Vast quantities of this grain are annually imported into this country from Holland and other northern countries, for the use of the gin distilleries; and who also buy all they can get of British growth, which not being kiln-dried, as most of the Dutch grain is found to be, is more valued.

It is a good deal cultivated in some of the poorest gravelly districts in the south of England, but only on *fallows* intended for wheat. In such light sandy or gravelly countries, the fallow-fields are thoroughly worked and cleaned by the first of June: they are then drawn out into ridges, ploughed and immediately sown. If convenient, the dung intended for the fallow is carted on, and spread and ploughed in, before the brank is sown; or this work may be deferred till the crop is carried in, in the autumn, just as it may suit the business of the farm.

A bushel of seed is enough for an acre, and if laid on regularly, when the ground is loose and warm, the plants soon make their appearance, and grow with great rapidity; so that the ground is soon covered and shaded by a dense mass of foliage. It begins flowering in July, and is generally fit to mow about the beginning of October. It is usually cut with scythe and cradle; and this implement in the hands of an expert workman is astonishingly expeditious. A good hand will cut down four or five acres per day with apparent ease. The scythe is *put out* for the purpose; and though nothing is cut easier than the green succulent stems, the scythe requires to be swung by a tall and strong man.

The crop is delivered from the scythe in swathes, as regularly as if laid by hand; and if the weather be fine, it quickly withers, and becomes fit to be carried to the rick-yard or barn. If put together a little green or damp, it does not much signify; for though ever so mouldy, the grain is never damaged, and the more mouldy it is, the easier it is thrashed. It is the easiest of all barn-work for the thrasher; as the slightest blow separates the grain from the straw; and as the latter shrinks into very small bulk, is never bound, and only fit for litter, it is soon out of the hand of the thrasher.

Three or four quarters per acre is a fair crop; its price generally ranges with that of barley, though, when much wanted by the distillers, double the price of barley is freely given. It has been proved a thousand times over, that the crop of wheat after brank is always better than if the fallow had been kept naked all summer, and whether the ground be dunged before or after the brank. This crop not only shades the ground, and smothers every weed, but leaves the soil in a fine mellow state. In wet summers, when the fallow cannot be cleaned early enough for a crop to be housed, a cast of seed is sown in August, to be ploughed in as a dress for wheat; but it is a very unsubstantial and fugitive kind of manure.

The uses of brank to an English farmer are but few. Horses should never touch it, because it heats and fills them full of bad humors. Neither is it good for fattening any kind of animal except pigeons and poultry; and it is the favorite food of pheasants, whether wild or tame. When given to store-pigs, it should only be in the proportion of one-third to two of any other kind of corn; that being the greatest quantity that can be given with safety. If pigs be allowed to range the brank stubble, they are very soon seized with delirium, and a violent kind of madness, running into water, rolling in mud, and crying in the utmost distress; and if allowed to repeat their visit to that stubble, fall away in condition most rapidly.

From it being so much and so constantly used in Russia and other parts of the continent, even as bread-corn, without hurtful effects, we must suppose that its deliterious qualities are dissipated by the oven, or in the process of cooking. But of the effects of brank grown in England, as stated above, I have been witness to repeatedly; and every farmer in those districts where it is commonly raised, is equally aware of its hurtful effects if uncautiously used.

Still it is a useful crop for shading poor thin land, if it can be sown after the fallow is perfectly cleaned, and be got off in time to sow wheat. A buckwheat farmer is, however, always considered an unfortunate man; because the cultivation of it shows the poverty of his land, and there are very few prosperous farmers upon land naturally poor.

But this is assuming that all gravelly or sandy soils are steril, which is not universally the case. I have seen much very productive sandy soils in the county of Bedford in England, and in the neighborhood of Musselburgh in Scotland. On such land brank may be raised successfully, especially in favorable summers; and even if the crop of grain be scanty, its service in keeping the ground shaded, and free from weeds, will benefit the succeeding crop, whatever it may be. I may also mention, that there is another crop raised by farmers on such soils, with the same view as that of sowing brank, namely, sowing trefoil or yellow clover thickly on the fallow, as soon as it is completely cleaned. This rises and becomes a very close sward before the beginning of September, at which time it is begun to be folded off by sheep, leaving the staple in a clean and rich order for the reception of the wheat seed.

I know not whether brank has ever been tried on the north side of the Tweed, or even to the northward of the Trent; but succeeding in much more northern latitudes, it certainly may have a chance even in the colder parts of Britain. But it must be considered, that a continental summer, though shorter, is much more uniformly warm than in any island, though farther to the southward. It is the *changeableness* of the British climate, much more than its want of temperature, that is so fatal to tropical vegetables; and as brank is as tender as the kidney-bean, a night frost in the end of September, or early in October, would destroy a principal part of the crop. After the grain is set, however, no degree of frost can damage it. I have often cut and carried a good crop after every leaf has been killed by frost.

The flowers are sweet-scented, and yield much honey, and consequently are much visited by bees; but the value of the honey is deteriorated, as it is much darker colored, and said to be inferior to that collected from heath and other wild flowers.

Whether brank will ever be an object of cultivation to light land farmers in general, is questionable; but from the present posture of agricultural affairs, many things will be introduced into our present systems, and many expedients had recourse to, to increase, if possible, the produce of the land, which have never before been thought of. Raw materials for the manufacturer, qualities for the dyer and druggist, and even that luxury tobacco, may come in for a share of that labor and care which has been heretofore wholly bestowed on raising the necessaries of life for man. Steam-power, as applied to the transit of farm products, as corn and fatted stock, and to that of lime and other dressings, is working, and will continue to work, important changes in the old routine of agriculture. Local advantages will be moderated, and local disabilities will be henceforth assisted in a way that but few are now aware of.

Extract from an Address to the Middlesex Agricultural Society, By Albert H. Nelson of Concord.

IMPROVEMENTS IN CULTIVATION.

We may learn the principles of farming then, by study, and why in the name of common sense may we not study books? Why should we be obliged to grope along, to stumble on in the thick darkness which our ancestors exerted themselves successfully to dissipate, when we may walk firmly and surely, would we but open our eyes? To illustrate my meaning. A young man comes into possession of a farm composed entirely of light sandy soil. His predecessors have, year by year, raised by dint of much labor, a small crop of burnt up hay, a small crop of potatoes, and a smaller crop of stinted corn. Now shall he toil on all his days, ploughing, sowing, and cropping the same fields in the same way, and with the same results, as did his ancestors? Or, would it not be far better for him to farm a little by book? To study the nature of calcareous and siliceous soils, to learn the different effects and qualities of manure, to introduce the turnip and clover culture, and a rotation of crops; and thus by the aid of a little science, double his produce and the value of his land at the same time? Shall he continue to cultivate certain articles without any regard to their adaptation to his soil, or shall he study the nature of the soil somewhat? Can there be a doubt as to what should be done? Our farmers work with their eyes wide open, I allow. They adopt improvements as fast as they are made in their neighborhood, so that they can see them; but they adopt *only* when they can see them. New modes of cultivation, and new articles of culture, are in this way gradually introduced. But they are introduced too slowly. The work does not go on fast enough. They do not keep up with the improvements of the age. There is much hesitation and doubt, after the time for hesitation and doubt has passed. The good old way, with all its imperfections, is adhered to in preference to a newer and better, merely because the one is old, and the other new. Our farmers have a thorough contempt for new things, and especially if promulgated by a book farmer, and in this way lose great advantages. Illustrations of this fact are abundant. How much writing, and argument, and persuasion it has cost to obtain for the mulberry, and the making of silk, their present partial and limited confidence! How slowly has the cultivation of Ruta Baga been progressing—and how much more slowly the raising of lucerne. How hard it is for people to give up keeping a little mountain of soil round each hill corn: how hard to use the roller and cultivator: how hard to give up cross ploughing! Or to illustrate this same feeling in a different way, it was forty years after spinach was introduced into the gardens of the opulent, before it could be bought in Boston market: and I doubt not but that there are those present who now hear the name for the first time. The rhubarb was twenty years in coming into favor: the tomato, the best of all summer vegetables, nearly as long: and the salsify is now hardly a regular marketable vegetable. While the sea kale of Great Britain has not been able to tempt a single cultivator, head lettuce as well known as it is, is seldom raised in the country, and the cauliflower more seldom still. "But the disgrace of being slow to receive valuable novelties, is not confined to our farmers and gardeners alone. The medical faculty of Paris proscribed as poisonous the potato, one hundred years after that plant had raised millions of vigorous troops who under Marlborough had again and again beaten the finest armies of France.

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How few farmers there are that actually study the nature of soils and manures, and crops? How few make any improvements save those they see instituted by their nearest circles of neighbors? All such they are willing to make. Now I ask, and the question contains the gist of the whole matter, why a man may not as well learn from the results of the neighbors' experiments and science when stated in a book, as when seen on a farm? Extend the same principle. Great men, practical men, in every part of the world, and for many years, have investigated the subject of agriculture, and have written on it: their plans and experiments as well successful as otherwise, have been noted; experiments have been properly instituted. Now if a farmer may learn from a book written by his neighbor, may he not much more learn from this collected wisdom of the whole world? Is it not a fact, and may we not point to shining examples from the members of this society, that those who have studied books, and become book farmers, are the best farmers, and have the best and most productive farms? Being willing to learn from those men, as we all are, and thus from books second hand, and why are we not willing to go ourselves to to the fountain head, and thus become pioneers in the cause?

* * * * *

I have thus, gentlemen, stated some reasons why you should prosecute agriculture as a science, and have thus briefly noticed some of the modern improvements in that science, in order to induce in your minds the question "Why may we not accomplish what others have accomplished?" And I ask the question—why may you not? Who shall say that an American cannot do as much as an English farmer? Who but the American himself, when he says he cares not for the science or the study of agriculture, and that he spurns such learned words? He who adheres to old customs, while every body about him is adopting newer and better, will fall far behind the age. And that farmer who continues to farm as did his ancestors, who entertains a sovereign contempt for scientific cultivation, will find himself every day growing poorer, because his more enlightened neighbors are every day growing richer and richer. I know that to treat farming as a science, to adopt the late improvements, or at least many of them, calls for a considerable outlay of money. But the investment is sure: the returns must be enormous for the amount expended: and they will themselves furnish the means of further improvement. There are multitudes of examples of what may be done in this way. Mr Coke of Norfolk, England, furnishes the most illustrious instance. Some forty years ago, he inherited a vast landed estate, the increase of which was then, $8000 per annum. Being an active and intelligent man, he introduced the Tullian system, which consists in a frequent rotation of crops, and in sowing in drills, and in his life time, by the plough and a proper succession of plants alone, he increased the income of his estate to $200,000; or, in other words he increased its value 24 times. Of him it was said, that "he disdained to hide his head beneath a coronet." Something like this every man may do. If we have not thousands to double every few years, we have hundreds or tens; and the smaller the sum, the the more the need of this result. The means are in every man's hands. There is no necromancy in the case; no peculiar skill is needed. Diligently use the faculties God has given us, and the advantages which our institutions secure, and the whole is accomplished.

We in New England have already done much. Our hills are rough and rocky and steril; our winters are long and tempestuous; our climate is inclement and unfavorable; but our arms have been nervous aud our hearts strong, and the rough steril fields have become gardens. The lines fell in rough spots to our fathers, but they have been made very pleasant homes. The founders of New England had difficulties to contend against, but they have been overcome. Just two hundred years ago, in 1636, a gentleman writing to England of the soil of this country says, "after five or six years it grows barren beyond belief; and whereas after, the land in England proves fertile for grass, this yields none at all, but like the land about Dunstable, puts on the face of winter in the time of summer." * * * "For the present we make a shift to live—but hereafter, when our numbers do increase, and the fertility of the soil doth decrease, if God discovers not means to enrich the land, what shall become of us, I will not determine—but it is probable we must either disband ourselves, like beasts straitened in their pasture, and so be liable to destruction from the natives (I mean the Pequods,) or else continuing together, be made the subject of some fearful famine and the misery that accompanieth it." How great the change! Two hundred years ago, the 10,000 inhabitants of New England feared a famine! Now more than two and a half millions are supported in the same country, and the energies of the land are not developed to the hundredth part! We apprehend no famine now: we fear not the sterility of the soil: we war not with the Pequods: our midnight slumbers are not disturbed by the howlings of ravenous wild-beasts. Peace, prosperity, and plenty is in our land. The little handful has grown to a mighty host. Our efforts have been prospered, and the earth has smiled. And now instead of fear for the issue, and prayers for succor, we confidently anticipate the time when in agriculture, as in everything else, we shall stand pre-eminent before the whole world. Truly may we say there has been a change! And shall it stop? or shall it go on? Shall we rest satisfied with what has been done, now that our energies are just beginning to be developed, and now that we have inducements greater than ever to press onward? By you, Gentlemen, and such as you, is the question to be solved. By directing to the science the same mental power, that you devote to anything else, and the same unwearied diligence, everything desirable will be attained. True, we have not the great staples, the sunny clime, the fertile soil of the south: but we have not slavery. True, we have not the luxuriant prairies and mighty rivers of the west: but we have what is wanting in those places, the good old fashioned New England habits of economy and industry. We have not the blessings of many other lands; but at the same time we have not the curses that are entailed upon them. We have everything that is needed to induce our surpassing all other lands in this science; and it rests with you, gentlemen, and your fellow workers in this cause, to say whether or not these results shall be attained.

From the Historical Magazine.

EARLY SILK MANUFACTURE IN THIS COUNTRY.

The introduction of a new branch of profitable industry into a country, must necessarily attract much public interest, as being immediately connected with the prosperity and happiness of all its inhabitants. Recently much attention has been awakened, by efforts to promote on an extensive scale, by means of societies and incorporated companies, the culture of the mulberry tree, with an ultimate view to the production of silk, either for exportation in a raw state, or for domestic manufacture. The legislature of several states, have favored these efforts by liberal and valuable charters, and congress has considered the matter of so much importance as to make it, through its committees, (selected with great care,) the subject of minute and expensive investigation. During the progress of legislative action, which has at different times, within a few years past, been had on this subject, various statements have been made, both in memorials of petitioners, and in reports of committees, that are not only deficient in the presentment of many particulars of interest, but exceeding erroneous in those that are given. Our object in alluding to this matter, is not to shed any new light on the processes of producing raw silk, or its manufacture afterwards. We profess no knowledge on the subject derived from practical experience, nor have we any specious or learned theory to present. But our only object at present, is to preserve some facts connected with the early history of the silk culture, which we cannot doubt, from present appearances, is destined to open a wide and profitable field for the exercise of American industry and skill. The subject may be dwelt upon hereafter more elaborately.

In a collection of Essays, published by Jared Elliot, of Killingworth, Connecticut, a gentleman who united in himself the three professions of a divine, a physician, and an agriculturist, we find many interesting particulars in relation to the production of silk. Mr. Elliot was an honorary member of the "society established in London, for the encouragement of arts, manufactures and commerce," and his zeal for making experiments which might result in benefit to America, was quickened into greater exertion, from his connection with that institution. The society, as appears from a pamphlet published by them in London, in 1761, note the following gentlemen as their American correspondents, who were also to pay premiums in their respective colonies, "for merchantable raw silk, raised and produced therein," viz: Dr. Jared Elliot, the Rev. Mr. Thomas Clap, (President of Yale College,) and Jared Ingersoll, Esq. of Connecticut; Benjamin Franklin, LL.D., and John Hughes, Esq. of Pennsylvania; George Pollock, Cullen Pollock, and John Rutherfoord, Esqrs., North Carolina.

The premiums were arranged by the London society, as follows:

"For every pound weight of cocoons produced in the province of Georgia, in the year 1761, of a hard, weighty, and good substance, wherein one worm only has spun, three-pence.

"For every pound weight of cocoons produced in the same year, of a weaker, lighter, spotted or bruised quality, though one worm only has spun in them, two-pence.

"For every pound weight of cocoons produced in the same year, wherein two worms have interwoven themselves, one-penny."

These premiums were, by resolution of the society, to be paid, so far as the province of Georgia was concerned, by Mr. Ottolenghe, superintendent of the silk culture therein, "to every person who would bring his or her balls or cocoons to the public filature at Savannah, according to notice (then) sent to Georgia."

The mode of proof to establish claims to premiums was minutely regulated. The fact to be established, was "that the silk has been actually and *bona fide* reeled from cocoons of the claimant's own raising and produce;" and the sum which should be paid by the society's correspondents, were to be repaid to them or order, severally, by the society, upon receiving accounts of the same properly attested.

It appears that the first attempt in this country to cultivate the silk business, was made in Georgia. The writer is not informed with regard to the time of its commencement there, but from a note appended to the essay of Doctor Elliott, and which is quoted at length, it certainly appears that the enterprise of Georgia, under the administration of Gov. Oglethorpe, first embarked in the manufacture of the American silk. The note is quoted at length, as it refers to an "account from Georgia," not in the possession of the writer, but which may be yet preserved, and in the possession of others.

"By a late account from Georgia," says Doctor Elliot, "it appears that the silk manufactory is in a flourishing way. In the year 1757, the weight of silk balls received at the filature, was only 1052; last year produced 7040, and this year already above 10,000; and it is very remarkable, that the raw silk exported from Georgia, sells at London from two to three shillings a pound, more than that from any other part of the world."

At the time when Mr. Elliot's essay was published, Georgia was increasing in the silk business. The writer is unacquainted with the reasons that have since led to its abandonment. Georgia, Pennsylvania and Connecticut, were specially selected as silk districts. The reason of this selection probably, was, that it was deemed important to test the advantages of different climates in raising the mulberry tree and the production of silk. The writer is not informed with regard to the result of experiments, if any were made, in Pennsylvania. The condition on which premiums were to be granted in Connecticut, as connected with the resolutions of the "London Society," was, that a public filature should be established in the colony, under the direction of the correspondents of the society, "to which every person should bring his or her balls or cocoons." A severe loss was sustained by those who were engaged in the silk business in Georgia, in the year 1758, by the filature or store-house taking fire, and being consumed, together with a quantity of raw silk, and *eight thousand weight* of cocoons. The quantity destroyed, enables us to form some judgment with regard to the extent of the silk business at that early day. Doctor Elliot says, that in the year when his essay was written, (1759,) those who had given their attention to the production of silk in Connecticut, informed him that "it was more profitable than any other ordinary business." He gives the two following authorities as confirmatory of his opinion.

He says, "some years past, I asked a man of good faith and credit, who had then made the most silk of any among us, what profit might be made of it; his reply was, that he could make a yard of silk, as cheap as he could make a yard of linen cloth, of eight run to the pound, &c. A woman of experience in this business, told me, that in the short time of feeding the worms and winding the silk balls, she could earn enough to hire a good spinner the whole year. I have not (adds the Doctor,) the least scruple of the informers' veracity, but how far their capacity might serve for an exact calculation, I know not."

The writer has been unable to ascertain the precise time when the colonists of Connecticut first directed their attention to the production of silk. That it was far anterior to the time specified in the memorial recently presented to the legislature, for the incorporation of a company, (upon which memorial and corresponding report of a committee, a charter has been granted,) is shown conclusively by the following extract from Doctor Elliot's essay.

The Doctor says, "I have been informed that at a place called Falkner's Island, which lyeth opposite to Guildford, there are vast number of young shoots (mulberry) which grow with such eagerness and obstinacy, that notwithstanding all endeavors to destroy them, the utmost efforts of the proprietors of the island, both by plough and scythe, has been used successively *many years*, as good hap is, without being able to accomplish it. A number of us here, (Killingworth,) and in the neighboring towns, with the leave of the owners, design to supply ourselves from them the next spring; for I apprehend that this way of transplanting young trees, will be the most expeditious, to get furnished for the silk trade."

As the essay from which the above extract is made, was written about eighty years ago, and the "plough and scythe" had been used for many years anterior to that period, in attempts to extirpate the mulberry, the planting of the trees must have been soon after the settlement of the colony. As we intend to confine this article to the early history of the silk culture in our country, (reserving for a future number, its decline and subsequent advancement;) it may be pardonable in us to pay a tribute of respect to the memory of a gentleman, to whose valuable labors we are chiefly indebted for the facts stated in this number. We cannot do better than by saying, that in the quietness of his character, in his social enjoyments, in his hours of meditation, and in the innocence as well as usefulness of his labors, he seems to have afforded a practical illustration of the truth of one of his paragraphs on the culture of trees. "Such groves (says he,) are proper places for retirement, study and meditation; this will have weight with those who love contemplation--those who are wise and good; he that is not company for himself, when alone, will be none of the most pleasing and edifying company for others; shallow minds who have no fund for their own entertainment, will afford but poor entertainment for others. The loneliness of a grove, the solemn shade, the soft murmur of the air in the tree-tops, all conspire to soothe our passions, calm the perturbations of the mind, recover our fleeting, wandering thoughts, and fix them on proper objects; here is true pleasure and serenity beyond all that pomp or noise can give; surely it is not without foundation, that in all ages and countries, trees and shady groves have been the favorite subjects of poets, both heathen and divine. It is needless, and it would be endless to recite what has been written on this darling subject: and I cannot forbear turning to one passage in Isaiah, the beauty of which has not been taken notice of. "The mountains and hills shall break forth before you into singing, and all the trees of the field shall clap their hands." This (says the Doctor,) is expressed with a grandeur and dignity, well adapted to the sublime subject, and is truly exalted and poetical.

REMARKS ON THE USES, VALUE, AND CULTURE OF SWEET POTATOES.

To the Editor of the Farmers' Register.

Columbia, South Carolina, January 5, 1837.

The interest on agricultural subjects seems to have much diminished of late in this part of the United States, and as much as I can perceive, in other parts also. When we have done with president-making, and the meetings of abolition societies at the north and west, we can talk of nothing else than rail roads. It is all very well, each in its proper place; but it seems to me, that we neglect too much our own natural, noble pursuit, agriculture. Formerly, this country furnished many parts of Europe, and the West India islands with bread-stuffs; but now Europe sends us flour, wheat, and other grains in great quantities, and *mirabile dictu*, even *hay*. I shall not attempt to seek for the causes of this anomaly, lest it should lead me into the interminable speculations about banks, currency, abundance or scarcity of money, good, bad, and indifferent. It seems enough to say here, what few will dispute, that there is something wrong in all this. Leaving then, these most elevated and fruitful subjects of discussion, I shall take the humbler task of making a few observations on the culture of the sweet potato.

At the 474th page of the number of your Farmers' Register, for the last month, in a piece signed S. Carter, this gentleman, very reasonably disbelieves the assertions of some of his neighbors, that the potato vines are poisonous to cattle; or, at least, that they occasion them to swell. As for the latter effect, it is very possible, that potato vines, as well as other rich succulent food, may, when eaten too greedily, or too abundantly, have that effect. It is, however, little to be feared at the season of the year when Mr. Carter speaks of cutting his vines for provender; for then, much of their succulence has dried up, and probably given place to highly nutritious matter. The saving of the vines of the potato for cattle is not practised in this state, that I know of; but it is not that they are not worthy of it; but because we are too careless in taking every advantage offered us by a bountiful climate. It may also be on account of the difficulty of curing these vines, so as to keep them in bulk. As to their nutritive quality, there are very few vegetables more wholesome and nutritious. Many years ago, I was informed, on authority scarcely to be doubted, that in the island of St. Domingo, horses and mules, were in many parts, entirely fed all the year round on potato vines; and my informant assured me, that he knew a cultivator in the vicinity of Cape Français, who made yearly about $10,000, by sending, every day, potato vines to the city, where they were bought for the exclusive food of horses, mules and cattle. On the plantation or farm of this cultivator, the vines, and not the roots, were the chief object.

I am glad to have it also in my power to strengthen the authority of Mr. Carter, as regards his experiment of planting small potato roots, for the purpose of producing sprouts to be transplanted in due time, into the beds prepared for them. This is a practice much followed in this state, and many persons, I among the rest, think these sprouts produce much the best potatoes for the table. It is a method well suited to those countries where the summer is too short to produce the potato in perfection, by any other. The usual way is to prepare a nursery bed of small dimensions, in a warm and sheltered situation, by manuring it highly with stable manure; make drills in this bed at very short distances from each other, from five to ten inches, and in these drills put small potato roots, so close as to touch, and cover them lightly. This should be done earlier than the usual season for planting the crop; and for fear of frost, the seed may be covered with straw, leaves, or some such matters. A bed about four feet wide, and fifty or sixty feet long, will furnish sprouts enough to plant at least an acre of ground. It is necessary to have the beds ready to plant the sprouts, so as to take advantage of every shower of rain to transplant whatever sprouts are large enough, that is a few inches high. The nursery bed will soon again be covered with a new set to plant at the next suitable weather. Potatoes produced in this manner, are generally smooth and well formed, and the crop very abundant. Every facility afforded, for the extended cultivation of this invaluable root, is undoubtedly a great advantage; for it is nutritive and wholesome in a high degree. Many planters in this state feed their negroes for several months exclusively on sweet potatoes, and during that period, they are all, young or old, healthy and fat. I have very little doubt but it might be advantageously cultivated for the manufacture of sugar, which it would probably produce in greater abundance than the beet; for not only sugar can be extracted from its ready formed saccharine matter, but also from the starch which it contains in great abundance. This is, at least, well worth the trial.

I am, very respectfully, sir,
Your obedient servant,
N. HERBEMONT.

THE PROPER DISTANCES FOR PLANTING CORN.

To the Editor of the Farmers' Register.

I hold it to be an axiom, that any subscriber to a useful and punctual periodical, who does not contribute to its support, by paying his subscription, and furnishing any useful facts or theories of which he is in possession, is worthy of any punishment which a jury of editors would inflict.

Not choosing to subject myself any longer to the penalty due to such an offender, I send you my subscription and my mite of matter. The first will, I hope, justify you in paying the post, whether the latter is worth printing or not.

In this world of fancies and Yankee notions, each man has his hobby. Some ride to the south, some glide swiftly on the bosom of the smooth canal; some fly through the air in balloons; some rattle on a rail road, and I, Mr. Editor, ride into my cornfield, and speculate on the value, while I am enraptured by the beauty of that queen of plants.

While all the world is agog for cotton, the poor corn is neglected by all but those who eat it. Let us turn our eyes to it, while I give you the results of some experiments and calculations on its culture.

On the Eastern Shore of Virginia (that most prosperous of all corn countries,) I am told it is the habit of the planters to plant their corn four feet each way—a single stalk at a place. When I first commenced farming, my impression was, that the most economical method of cultivating corn, all things considered, was to plant it so as plough it both ways, and thereby dispense with the hoe-work. I tried it. Experience and reason have changed my opinion. In 1835, I cultivated a light sandy field in corn, (much such land as that on the Eastern Shore, but not so good.) Part of it I planted 5 by 3, and part (the best land) 4 by 4 feet—both were ploughed both ways, and received the same culture: the cut 4 by 4 was favored rather the most, because it seemed to suffer. The result was, the corn 4 by 4, suffered for distance, while that 5 by 3, had a plenty of room, and was a good crop. This set me to thinking—and the result of my cogitations amounted to the conclusion, that corn must have a plenty of distance one way; else why was the corn 4 by 4 too thick, while that 5 by 3 had distance enough—when there were more stalks on an acre of the latter, than on one of the former—which reminds me, that many persons, and they intelligent and educated farmers too, think—no, conclude without thinking—that because 4 and 4, and 5 and 3, and 5½ and 2½, 6 and 2, and so on, when severally added, make 8—that, therefore, there are the same number of stalks on an acre, planted in either way.

This you know is not the fact—on the contrary, the number of stalks is inversely as the *product* of the two numbers. For instance, the number of stalks on an acre 4 by 4, is to the number on an acre 6 by 2, as 12 is to 16. The reason is this—more land can be contained in a square, than in any other rectangular figure—consequently, there are fewer squares in an acre, than there are of any other rectangular figure—so, also, the nearer these figures approach to a square, or the farther they are removed from one, the less, or the greater is their number.*

This important consideration, together with the fact above stated, resolved me to cultivate my corn this year on a different plan.

I accordingly planted it 5½ feet one way, and 1½ to 2½ feet the other, according to the quality of the land. My corn was as good, and better worked in this way, and I cultivated it with as little trouble. By using an X wooden drag, twice in a row, about a week after each ploughing—first, when the grass begins to spring, you leave your land as level, and keep it as clean, as you can by cultivating it in any other way—hoe or no hoe. Moreover, the greater the distance one way, the less your corn will be ridged by ploughing; and, therefore, the more dirt you can throw immediately around it without injury. If I am wrong in any of my deductions, I hope you, or some experienced corn planter, will put me right: for, until experience or reason changes my views, I will plant any land 6 by 2, which, according to old style, would be planted 4 by 4. There are ¼ more stalks on an acre of the former, than on one of the latter. I contend the last is the thickest. In the mean time,

I am, yours, &c.
SIX AND TWO.

ORONOKO AND PRYOR TOBACCO.

To the Editor of the Farmers' Register.

Ward's Fork, Charlotte.

Having made some experiments, during the past season, with the two most popular kinds of tobacco, to wit, Oronoko and Pryor, (well calculated to test their respective merits,) I herewith send the result, for publication in the Register.

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* The proper and simple rule for comparing spaces, or distances of plants, is to multiply the length and breadth together, and thus ascertain the number of square feet given to each plant, or station. Thus 4 by 4 feet, makes 16 square feet, and 6 by 2, 12 feet only. Yet simple and obvious as is this truth, it is both true and surprising, (as stated by our correspondent,) that many old and experienced corn planters still compare the spaces, afforded by these and other different distances, by *adding*, instead of *multiplying* the length and breadth together.—ED.

Believing, that notwithstanding the little interest felt in the tobacco crop at present, it is a matter of considerable importance to those who cultivate it at all, to know which kind it is most to their interest to plant. Having thought for several years, that the Oronoko tobacco, matured earlier, and yielded more in weight, than any other tobacco I had ever made—I proceeded during the last season, to submit that opinion to the strictest test, by actual experiment in the following manner. While setting out a rich highland lot, with Oronoko plants, we got some Pryor plants, from a neighbor's bed, close at hand, and planted a row nearly through the centre of the lot, with those plants. And after having given the whole lot the same cultivation and attention during the season, I designated a row of Oronoko, running parallel with the Pryor, for experiment; and in the month of September, when the row of Pryor was thoroughly ripe, (by which time, however, a number of the plants in the row of Oronoko, had, to all appearance, suffered for the want of cutting,) I proceeded to cut the two rows, laying the plants to the right and left, and after they were "limbered" sufficiently by the sun, I carefully weighed them separately, and found the following result—to wit: 48 plants of Pryor, weighed 62 lbs., and 48 plants of Oronoko, weighed 78 lbs. Difference in favor of Oronoko, 16 lbs. I then had both Pryor and Oronoko, hung on sticks separately, placed in a barn, and cured with fire—and again submitted them to the same test, with the following result; Pryor, where cured, weighed 18 lbs. Oronoko, when cured, 22½ lbs.: difference 4½ lbs. in favor of Oronoko. On stripping the two parcels, the difference still greater in favor of the Oronoko—the stalk of the Pryor being much longer and harder than the Oronoko. I would remark, that I made a large cutting in the above-mentioned lot, ten or twelve days before the experiment rows were cut, at which time, there was not a plant of Pryor ripe, but several of the Oronoko ought to have been cut. I think from the best observations I have been able to make, the Oronoko, is from ten to twenty days forwarder than the Pryor, which is a matter of considerable moment, to those planters whose lands have become slow, from excessive cultivation. And when we add to these advantages, the still more important one—that the Oronoko, commands a much higher price for manufacturing purposes, I am decidedly of opinion, that it ought to have the preference over all other kinds for general cultivation. The only objections I have ever heard against it, are, that on rich wet land, it breaks and "fires," more than other kinds. As to the first objection, I am satisfied that a leaf need not be picked up that breaks off, and much more of it will be made, than of any other. As to the second objection, I am not probably qualified to judge correctly—for in the cultivation of fourteen crops of 100,000 plants each, I am satisfied I have never lost 500 plants by "firing." My land is uncommonly free from that objection.

I also made an experiment with plastered and unplastered tobacco (all Oronoko,) with the same care, with the following result: 40 plants of unplastered tobacco, after being cured, weighed 13 lbs.—40 do. of plastered, when cured, weighed 16 lbs.—difference in favor of plastered, 3 lbs. This tobacco grew on a lot that has been kept up mainly by clover and herdsgrass, on the three-shift system. The tobacco was only plastered once, about the time it began to spread, on the hill generally, with about a tea spoonful to each plant. The difference was manifest during the whole season, even at three hundred yards distance.

I had also several experiments almost consummated, on corn, by pulling and not pulling fodder, cutting and not cutting tops, all of which were carefully put away in my farm pen, preparatory to measuring and weighing. When lo! my plans were suddenly *dashed* by a mischievous ox, breaking in upon them, not only in violation of the Sabbath, (on which it happened,) but also the law of "*quare clansum fregit.*" I hope, however, at a future time, to be able to mature similar experiments, and communicate the result for publication.

R. I. GAINES.

GOOD AND INCREASING EFFECT OF MARL.

To the Editor of the Farmers' Register.

Berkley, Charles City, January 3, 1837.

* * * * * * *

Before closing this letter, I have an act of sheer justice to perform. Some sixteen years ago, you were liberal enough to allow me permission to procure several vessel loads of marl from your shores. These were applied principally to a belt of land, and running through a large field, which contained all the varieties of soil from a cold white pipe clay, to a light loam; all, however, greatly exhausted. Shortly after its application, I discovered a considerable improvement in the land; and with a view of equalizing the fertility of the adjacent ground, I applied a considerable quantity of stable and farm-pen manure, to a strip on one side of the marled belt. The succeeding two or three years, both pieces exhibited fine crops; since that period, the difference between the marled land and manured belts, is every year more manifest; and I think, it may be said, with entire truth, that the portion marled, is fully equal to the production of ten barrels of corn per acre. When last in wheat, my principal scythe-man, on approaching it, remarked to his fellow-laborers, "this is a monstrous growth of wheat—there must have been an old farm-pen here;" another replied: "It is no farm-pen, but the marl from Mr. Ruffin's." As I believe your journal is of great public utility, I sincerely wish you success in it,

And am respectfully,

BENJ. HARRISON.

For the Farmers' Register.

APPLES AND CIDER.

A writer in the Register, who has spent his "two last summers and autumns in the apple regions of the north," has collected thirteen propositions. With some of them I entirely agree, and from others I entirely dissent. The evidence cannot rest on the personal knowledge of your correspondent, but must have been derived from hearsay. I therefore feel myself at large, to question it, without infringing the rules of civility.

I live on lands flowing with cider of the best sort; I have drank it freely from my boyhood; I greatly prefer it to ardent spirits, and all kinds of wine, except champagne, to which it nearly approaches, when well made of good fruit, and care fully bottled. I have always thought it salutary to myself, and when my servants have it in plenty, in the fall, I have supposed that it kept them in good health, spirits, and temper. The late Doctor Rush, a man of profound science, and deep observation, recommended cider as a healthy beverage for laboring people. Governor Barbour highly approves it—and the late Doctor Dwight, a laborious student, and devoted christian, speaks of it as the best remedy for a nervous headache—and recommends it to men of sedentary habits. Against these high authorities, your correspondent has been led to believe that a hogshead of good cider was pregnant with almost as many evils, as the fabled box of Pandora.

I agree that a still is a bad appendage to an orchard, and that distilling cider is an error, both in profit and morals: but candor obliges me to say, that a small dash of good old peach, or apple brandy, greatly improves punch, and apple toddy.

There are orchards on my farms, to the planting of which, the memory of man doth not run. The impression here, has been, that cider lessens the inclination for whiskey and rum—and thus tends to preserve the morals of the blacks; and it is very rare to see intoxication among them by cider. Some years ago, finding my apple trees were declining, I planted new orchards: they are now in full bearing, the fruit is fine, and the cider is excellent. In doing this, (in addition to my own personal gratification,) I felt a moral obligation to make wholesome provision for posterity. If I could be convinced that, in rearing orchards, I had laid a foundation for "rheumatism," "inflamed eyelids," "headache," "bleeding at the nose," "sores and ulcers," "affections of the stomach and bowels, and premature trembling of head and hands," I would do by my orchards, what I understand you are doing in Virginia, (under the salutary influence of the temperance societies,) by your mint beds—root them all up.

I am pleased to learn that sweet apples, are excellent food for horses, cattle, and sheep, and that they keep the horses of practicing physicians, in Connecticut and Massachusetts, sleek and fat. I wish B——y J——n, and Dr. M——e, would try them on their racers. To their opinions, entire confidence would be attached—and it would make an important change in agricultural economics. I once knew of a herd of fifteen milch cows, breaking into an orchard of sweet apples, at night, and thirteen of them were down next morning with the colic, and were saved only by heavy drenching with ley. Your correspondent has also learned, at the north, that hogs, if they can get sweet apples, care nothing for Indian corn, and will fatten without it. My hogs had the run of my orchard, last fall, of sweet apples, which they abandoned for acorns, as soon as they began to fall; and they required four weeks feeding with Indian corn to make them prime pork. Northern hogs, like northern men, may have their peculiar tastes. Yankees delight in pumpkin pies, and molasses. Southrons prefer pork, and hominy.

I have rarely seen a cider drunkard to the south, and have always supposed that intoxication had the same effect upon the moral and physical constitution, by whatever means it was produced. Climate may cause the difference. Brandy, gin, and rum, if we can believe travellers, have but little effect on northern men, and northern women. A Russian countess, after drinking six glasses of brandy, will dance a waltz with a firm foot and a steady head. A Maryland, or Virginia lady would find her balance doubtful after one. I have somewhere read of a young physician, who had studied in Germany, and who, upon his return to England, cured a Frenchman of a fever, by a salt herring, at Calais, and next day killed an Englishman at Dover, by the same prescription.

Yankees are a queer guessing hoaxing people. In the absence of other game, they will prey upon each other; but when they start a southron, they all open upon him, like a pack of fox dogs on a stray cur.

From the Farmer and Gardener.

LIME SPREADER.

[The difficulty of making an uniform distribution of any given quantity of lime on an acre of ground, and the injury experienced by laborers engaged in the operation, have long been felt by the agricultural community, and we are, therefore, happy in believing that both these inconveniences have been obviated by the invention of our ingenious townsman, Francis H. Smith, Esq., who we believe has succeeded in so constructing a cart that any given number of bushels of either stone or shell lime may be equally spread over the entire surface of a field of any dimensions. His cart has been submitted to the test of practical experiments upon the farms of several of the gentlemen in this vicinity, and as we learn, gave the most decided satisfaction in every instance. The last experiment is thus flatteringly spoken of by several of our most extensive and intelligent landholders, and from our personal knowledge of the accomplished inventor's acquaintance with mechanics as a science, we have no doubt it will receive the approbation of the entire farming and planting interests.]—ED. FAR. AND GARD.

Having this day witnessed at the Orange farm, the operation of F. H. Smith's machine for spreading lime, we cheerfully unite in giving our opinion of the result. The shells were thrown into the cart direct from the kiln. These were sufficiently ground up and distributed with uniformity over the land as the cart was moved along. We are of opinion that no manual operation could do the work so well. The quantity per acre, *judging* merely from observation, in the three several degrees exhibited to us, was about 50, 100 and 200 bushels. It is evident however, that the *quantity* may be regulated at pleasure. This experiment was made with *shell* lime. One of the undersigned has, with the machine, covered seven acres with *stone lime*, with great expedition and to his entire satisfaction. We are of opinion that it is equally adapted for spreading ashes, marl, or any friable manure. We are so well pleased with the machine that we have each of us ordered one from Mr. Eastman.

J. W. Patterson,
James Swan,
Robert Gilmor, Jr.
S. W. Smith,
Wm. Donnell.

Baltimore, Dec. 29, 1836.

J. S. Eastman has now put twelve of the above machines in hand, which will require six or eight weeks to complete. Part of them are already engaged; those who wish to have it in time for operating in the spring, and advised to have their names at his Agricultural Warehouse in Pratt street.

The cost of the machine, including the patent right, is $100. To apply the machinery to a wagon or cart $45. In five minutes the machinery may be detached.

MR. WHITMARSH AND HIS AGENT.

[In the last No. of the Farmers' Register, we inserted from the "*Silkworm*," an account of the *transactions* of Mr. Whitmarsh, in regard to *his* Chinese mulberry seeds and plants, with our comments thereon. We now republish, from the Genesee Farmer, the defensive replies of both Mr. Whitmarsh and his agent, to an editorial article of severe and well deserved censure, which had appeared in that paper. We are quite willing to make Mr. Whitmarsh's defence as extensively known, as the censure of his course: but, notwithstanding, will express our opinion, (very different from some of our brother editors,) that his letter falls far short of exculpating him from the intention to deceive purchasers, and willingness to pocket the profits of their being deceived. What the purchasers wanted, and expected to obtain, was the *morus multicaulis*, universally understood to be meant, in this country, by the name of "Chinese mulberry,"—and not *another Chinese mulberry*, the merits of which are just now discovered, or brought to light, by Mr. Whitmarsh's observations, and which may, or may not be, superior to the *morus multicaulis*—and which few persons would have cared to buy, if announced in that manner at first, and still fewer *now*. As to Mr. Huntington, the agent, his best defence would have been, that he, like the public in general, was *cheated* by the language of his principal's first recommendatory statement: but he has forfeited that ground of defence, by having failed to expose and apologize for the deception, after he learned it, and by continuing to press on the public the sales of this mulberry—whether a new and valuable species, as alleged by Mr. Whitmarsh, or merely *dead* plants and damaged seeds of the common white or Italian mulberry, as supposed by the nurserymen who have planted them. If Mr. W. had at first stated, plainly and fairly, his views as now expressed, as to the superior value of a new variety of mulberry, his opinions would have passed for what they were worth. No blame could have attached to him in case of disappointment to those who might have relied on these first and hasty impressions—and if not found to be mistaken, he would have been justly acknowledged (as his defenders claim to be his due,) to have acted from a desire to benefit the interests of his country. But it is evident that such a course would have put but little money in his pocket, compared to the inducing a belief that purchasers would obtain from him seeds and plants of a variety whose value was already so well known, that the eagerness to possess it seems something similar to the prevailing mania for speculation in gold mines and western lands. Hence, a sufficient reason for Mr. Whitmarsh's choice, supposing him to prefer solid cash, to barren praise and honor.]—Ed. Far. Reg.

From the Genesee Farmer.

We very cheerfully give place to the following letters, that Messrs. Whitmarsh and Huntington may derive all possible benefit from the publication of their statements; and our only regret is, that these letters do not afford a more satisfactory reply to the statement published in this paper on the 3d inst. Here are the letters, to which we append several notes, which we deem necessary to a correct understanding of the subject:

Northampton, Dec. 11, 1836.

L. Tucker, Esq.—*Sir:* I have read with pain an article in your paper of the 3d inst., in which you accuse myself and agent, C. P. Huntington Esq. of deception—wilful deception—in the sale of mulberry seed last spring. This, sir, is a most serious charge to make, and that too, without the slightest evidence, and respecting those of whom you say you know nothing. Would it not have been well to have made some inquiries? or even have addressed me on this subject? Mr. Huntington, I trust, is able to answer for himself. I will only observe, that if any deception has been practised, it must rest on my shoulders.

Has there been any deception in the case? You say positively that there has. May I ask in what? [*a.*] Was it that the seed did not vegetate? or that I intended that it should be received as the Multicaulis? That it did not vegetate as well as could be wished, is most certain—of that I could not be aware, as I had no means of trying it—it had every appearance of good seed. Was it sold as Multicaulis? [*b.*] I answer most decidedly, it was not. In my search for Multicaulis seed, I was told that it could not be had in Italy or France—that the tree produced but little seed, and that little could not be depended on; but they had a small quantity of *Chinese mulberry* seed—which was more hardy than the Multicaulis, and better in many respects. I was shown the trees, along side of the Multicaulis; the thermometer then standing at 5° *below* zero, and had been the day before at 14° *below*. I compared trees of three years old, down to those of seed grown in August, with the white, and found every indication of a hardier tree than any we have in our country, and better than any I had seen in my travels—one well calculated for our climate—the leaves from six to eight inches, and very close jointed. I forwarded the seed to my agent, which he did not receive till my arrival, on the 28th or 29th of April. I immediately caused notice to be given by letters and otherwise, that this *was not the Multicaulis*, but a distinct variety. Nine-tenths of the seed was purchased or delivered to order, subsequent to the notice. I have now orders from several persons (well acquainted with the facts,) for the same kind, which I am daily expecting, and that too, in preference to the Multicaulis, which I now have received, and which was raised in the *Phillipine Islands*—not in France, as was supposed by my agent. The nurseryman—who wrote you that sweet letter, wishing you to chastise me—could not distinguish between that and the white!! Does he know a white oak from a black oak? I must take leave of the subject by repeating that there has been no deception practised, and that in my opinion, at least, the plants are more valuable than the Multicaulis, which time will decide.

As you, perhaps, will not be willing to credit my assertions respecting the seed, I enclose you the original bill as I received it from the hands of the person who signed it, erasing the figures only.

In publishing the article you have wronged, deeply wronged, my agent and myself. I appeal to your sense of honor and justice, and request that my letter be inserted in your next number, that those interested may form their own opinions.

Respectfully,

SAMUEL WHITMARSH.

Northampton, December 12, 1836.

To the Editor of the Genesee Farmer:

Your paper of the 3d inst., has been handed me, in which you have indulged in certain strictures upon Mr. Whitmarsh and myself, in relation to the sale of mulberry seed. Mr. W. informs me that he has written to you, but as you have seen fit to include me in your denunciations, I beg leave to say a few words for myself. As your remarks breathe a spirit of prejudice, not to say hostility, I think it would have been more fair, had you not prefaced them with demonstrations of candor and disinterestedness. I hope you did not intend by these professions to give more point to your poisoned shafts, and though at heart you may feel reluctant to admit this communication, yet that you will feel bound by your avowal of impartiality to give to the public, through your columns, a brief statement of facts, so far as I am concerned.

The advertisement of the "Chinese mulberry," which you copy from the Hampshire Gazette of March 28, was ordered by Mr. Whitmarsh while in Europe, and its terms, and description were dictated by him. This was the first knowledge I had of his purchasing or intending to purchase seed. I then supposed, as you say others did in your vicinity, that it was the Multicaulis. Mr. Whitmarsh did not arrive till quite the last of April, and the seed did not come to hand till after his arrival. It was not until I saw him that I found it was not the Multicaulis, and I immediately stated in the Hampshire Gazette, that it was not, in the paragraph which you have carefully preserved and copied. [c.] I was, myself, solicitous to do away any incorrect impressions which I had innocently given, and Mr. W. also stated expressly, that he did not wish any one to take it, except with a knowledge of the facts. This correction would come to the knowledge of all the readers of the Gazette, and of all the exchange papers which were requested to copy that advertisement. Not only this, I took particular pains *before any orders had been supplied*, when personal application was made for seed spoken for, to state that it was not the Multicaulis, and I so stated where it was sent abroad, [*d.*] except when the season had so far advanced that it was too late for delay, when time had been given for the information to be diffused, and when I had ascertained that purchasers were almost in every instance, as well satisfied with the article sold, as with the Multicaulis. In one instance, an individual demanded a return of his money because it was not the Multicaulis, in so insulting a manner, that I referred him to Mr. Whitmarsh. It is not true, as you state, that an agent was despatched to Rochester with the seed. [*e.*] Messrs. Reynolds & Bateham had sent a very urgent order, and a gentleman of this town happened to be going to Rochester on a visit, just as the seed arrived, and I requested him to supply R. & B.'s order, as a favor to them. He took a few other papers and sold just seven of them, and no more. He was particularly instructed not to sell it as the Multicaulis, and to inform purchasers that it was not the Multicaulis. I have seen him to-day, and he tells me that he perfectly recollects those instructions, and that he gave the information to those few who bought of him, and *to Reynolds & Bateham themselves.* [*f.*] This was the only seed delivered or sent away before the notice was given in the Gazette that it differed from the Multicaulis, that I recollect. You see then, that the foundation on which you rest your weightiest charges is removed, and of course, the whole fabric of false accusation falls to the ground. Your main charge, so far as I am concerned, is, that this information was not given, "*till after the orders had been supplied.*"

Besides the refutation given above, the very paragraph you quote from the Gazette of May 4, shows its falsity. That article begins, by saying, "the Chinese mulberry seed which we advertised but a few weeks since, has come to hand, and can be had by calling at our office," &c. *stating the* price, &c. that it was not the Multicaulis, and quoting Mr. Whitmarsh for the character of the plant. I had previously informed persons giving orders, (in the Gazette, I think,) that they would be notified through its columns, of its arrival. Here then is a paragraph for the first time, announcing its arrival and price, and yet from this paragraph, you infer that most, if not all, of the orders had been supplied! [g.] The public will judge what your inferences are worth. They can determine whether one would be likely to advertise the arrival of an article, after it had been already sold! whether it should have been at the pains of informing persons who had given orders *that their* seed had arrived, when they had it already in their possession! Indeed, it appears from your statement, that Reynolds & Bateham *knew that* it was not the Multicaulis, for you say that they refused to sell it on this account. How could they have known it in less than a week after its arrival, except through ourselves? As to the quantity of seed in a paper, I never weighed or counted them, relying upon Mr. Whitmarsh, and in him, I had then, and have now, perfect confidence. He has throughout manifested a zeal, enterprise, and public spirit, rarely to be found. He has hazarded every thing in the culture of silk, except reputation, and that you and your backers seem disposed to take from him. As to the character of the plant, I do not profess to be a judge, but I am satisfied from the opinion of our best cultivators of trees, that your seedsmen and nurserymen, if they have not been imposed upon by pedlers of spurious seed, are but poorly fitted to talk about trees, from cedars down to the hyssop.

Yours, &c.

C. P. HUNTINGTON.

Notes.

[*a.*] The deception charged, consisted in advertising and selling a spurious seed, for that of the Morus multicaulis; and the deception is explicitly acknowledged in the above letter of Mr. Huntington, where he says:

"The advertisement of the Chinese mulberry, which you copy from the Hampshire Gazette of March 28, was ordered by Mr. Whitmarsh, while in Europe, *and its terms and description were dictated by him.* * * * I THEN SUPPOSED, as you say others did in your vicinity, THAT IT WAS THE MULTICAULIS." "*It was not until I saw him* [Mr. Whitmarsh,] *that I found out it was not the Multicaulis.*"

[*b.*] We answer that it was, inasmuch as it was sold under the advertisement which Mr. Huntington acknowledges deceived him into the belief that it was the Morus multicaulis; and that it was *bought* as the Morus multicaulis, the following statements abundantly show:

Mr. L. Tucker—As you wished to know the circumstances of my obtaining the mulberry seed of Mr. Whitmarsh, or his agent, I will state them. Mr. Bradley, a gentleman living in this vicinity, informed me that a friend of his, Mr. Fancher, from Northampton, was at his house, and that he had some of the Chinese mulberry seed for sale. I requested Mr. Bradley to ask Mr. Fancher particularly, if the seed was the Morus multicaulis, or the Chinese mulberry, and if he could say that it was such, I would take three papers; but if he (Mr. Fancher,) had any doubts of its being the Morus multicaulis, or Chinese mulberry, I did not wish to take any of the seed. Mr. Fancher stated to Mr. Bradley, that he thought the seed was the Morus multicaulis, and that Mr. Whitmarsh would not impose on any person so much, as to sell seeds under false pretences; and Mr. Fancher left three papers of the seed for me. Mr. Fancher informed Mr. Bradley, that he had sold four or five papers of the same kind of seed in Rochester, also twenty-five papers in Utica, and had also sold at different places on the route from Northampton to this place, and that he had more of the same kind of seed for sale. Some days after I had purchased the seed, Mr. Fancher returned, and called at my house. I then told Mr. Fancher, that in my opinion, Mr. Whitmarsh had imposed on the public in the sale of his mulberry seed, as by his advertisement, the impression had gone abroad, that the seed he was selling was the Morus multicaulis, and that Mr. Whitmarsh's own proceedings would prove that to be the case; for after quantities of the seed had been sold, Mr. Whitmarsh had come out with a notice, informing people that the seed he had sold was not the Morus multicaulis, but another variety of the Chinese mulberry. Mr. Fancher replied, that if there was any deception, he was clear of any on his part, as he had sold the seed as it was represented to him.

Respectfully yours,

ASA ROWE.

Rochester Seed Store, December 21*st*, 1836.

Mr. L. Tucker—In answer to your inquiries I would state, that on seeing his advertisement of genuine Chinese mulberry seed and trees, we sent Mr. Huntington a letter, ordering $25 worth of the seed, and inquiring the price of the trees, to which we received a reply, dated Northampton, April 13th, stating that Mr. Whitmarsh and the seed had not yet arrived, but he had entered our names for five papers of the seed, adding, "it is more precious than gold dust, as you will perceive, having been collected at great expense, and warranted," &c.

On the 4th of May, a Mr. Fancher called on us, as agent for Mr. Whitmarsh, delivered our seed according to order, received the money, and offered to sell us more if we desired it. As the business was done with Mr. Reynolds, who is now absent on a journey, I cannot be positive as to all that was said, but I am confident that no intimation was given him of its being any other than the seed of the genuine Chinese mulberry, or Morus multicaulis; for when a few days afterwards, the article in the Northampton paper, stating that it was not the Morus multicaulis, was shown him in my presence; he expressed his surprise and disappointment, by saying, he believed it was all a hoax and deception, and suggested sending the seed back to Mr. Whitmarsh. But on reflection we concluded to sow it ourselves, and see what the result would be; accordingly we sowed it all, except one paper, and the product was, as has been previously stated, nothing but Italian mulberry, and but few of them.

Yours respectfully,

M. B. BATEHAM,

Of the firm of Reynolds & Bateham.

Mr. Tucker—In answer to your inquiry, I will state, that at the time I purchased the two papers of mulberry seed, alluded to in your paper of the 3d inst., no notice was given me that it was not the *Morus multicaulis*, and the first intimation I received, that the seed was not the genuine Chinese mulberry, was contained in the article from the Hampshire Gazette, of the 4th of May. I bought a quantity of the Chinese mulberry trees imported by Mr. Whitmarsh, and supposed the seed and plants both to be the genuine Morus multicaulis. The plants proved genuine—the seeds produced, as I believe, the white Italian mulberry, or a variety so similar to it as to render it difficult to detect the difference.

RALPH CHENEY.

[*c.*] The reader should bear in mind, that this statement was made in the Hampshire Gazette, on the *very same day*, that the agent, Mr. Fancher, was in this place.

[*d.*] Witness the copy of a letter from Mr. Huntington, to Mr. J. Swett, published in the Farmer of last week, which is as follows:

"Sir—Enclosed is a paper of Chinese mulberry seed, $5. You can have more, if ordered soon.—*C. P. Huntington, for S. W.*"

[*e.*] See Mr. Rowe's statement given above, in relation to Mr. Fancher's agency. We may also add, that we were in Albany at the time Mr. Fancher returned from the west, and he was spoken of there as, and understood to be, the special agent of Mr. Whitmarsh.

[*f*.] See Mr. Bateham's letter. Mr. Reynolds also expressed to us his indignation, at what he considered a cheat, in the strongest terms, which he would not have done, had any such story been told him, as Mr. Huntington states.

[*g*.] Our inference was drawn from the fact, that the seed was distributed in this section, some days before the publication in the Hampshire Gazette could have reached this city, and not from the fact of that publication itself, which makes a very important difference. This, with the remaining part of Mr. H.'s letter, only shows his ability at special pleading, and the "public will judge what it is worth," when they call to mind that we have shown conclusively, that there was time enough, after the arrival of the seed at Northampton, to have supplied all the orders which could possibly have been received, before the announcement in the Hampshire Gazette, that it was not seed of the Multicaulis.

From the British Quarterly Journal of Agriculture.

ON THE APPLICATION OF STEAM TO THE PURPOSES OF HUSBANDRY.

It is now upwards of three years since, at a meeting of noblemen, members of parliament, and gentlemen connected with the landed interest, brought together principally by the exertions of the writer, the three following resolutions, which he had prepared, were unanimously adopted:

> "*That* the application of steam to inland transport and agricultural purposes will, by cheapening the production and saving the consumption of the food of the country, be accompanied by advantages to all classes of the community of the most extensive and permanent utility, and that, as such, this meeting considers it highly entitled to their support, and that of society at large.
>
> "*That* the practicability of applying steam to general locomotive purposes was satisfactorily proved by evidence before a Committee of the House of Commons in 1831, who reported the same to be 'practicable, safe, one of the greatest improvements in the mode of internal conveyance ever introduced, and entitled to legislative protection; and that, since that time, it has been farther and fully established by numerous successful experiments."
>
> "*That* this meeting considers it desirable that an association be formed for bringing the measure forward in the most prominent manner, which its own importance, political and commercial, and the exigencies of society require, to be called a Society for Promoting the Application of Steam to General Transport and Agricultural Purposes."

This association, though about forty members of parliament consented to act on the provisional committee, from the various political changes which occurred during the sessions of the years 1833 and 1834, came to nought; but it proved to be the nucleus of that co-operation on the part of a few zealous and persevering friends of agriculture, which, after surmounting many difficulties and discouragements, eventually realized, on the 15th of December last, the formation, in the metropolis, of "The Central Agricultural Society of Great Britain and Ireland." On the occasion above referred to (23 of April 1833,) the Chairman Henry Handly, Esq. M. P., observed, that he felt himself incapable of doing justice to the position in which the meeting had placed him, having no mechanical or engineering knowledge, nor boasting any scientific acquaintance with the subject; he was, however, strongly impressed with its immense importance; he felt steam was the most mighty engine as yet confided to mortal hands, that its powers and resources had been hitherto but partially developed, and that he anticipated ultimately the greatest advantages to every class of society, from its application to the various purposes of transport and agriculture. Farther, he took occasion to observe, that he had, four years prior to the date of the meeting, entertained the project of the application of mechanical power to agriculture, and, for that purpose, had offered a premium for the invention of a steam-plough; he had the assurance of many scientific men that it was perfectly practicable, and he attempted to form a society with a view to its encouragement, but failed. He still entertained the same opinion as to the advantages to be derived from it, and felt that, as he feared the agriculturist would receive no legislative or financial relief, the only mode by which certain inferior natural wheat lands could be retained in cultivation would be by substituting inanimate for animate power, whereby diminishing the cost of production. In saying this he begged to observe, that were it probable the application of such a power would tend to diminish the demand for manual labor, he for one would never become its advocate. However, on the contrary, he felt satisfied it would very materially increase human labor, for, by displacing animal power, it would effect an enormous saving in the consumption of the food of man, and a reduction in the cost of cultivation. Colonel Torrens, M. P., who is well known to the public by his writings on political economy, in moving the first resolution, stated, that the Select Committee on Steam Carriages, which sat in 1831, of which he had been a member, had given the project a patient and full investigation, and had taken the evidence of a number of eminent engineers, and others practically acquainted with its detail: that the report embodied the full and explicit sense of the committee as to the practicability, safety, and utility of applying steam to the purposes of locomotion. In reference to the economic advantages that would result to society from this extension of mechanical power, he believed they would be very great. The bringing of agricultural produce more cheaply to market would tend to increase profits, to encourage industry, and to enlarge the demand for labor, whilst considering how it would enable us profitably to extend cultivation, and apply with advantage additional portions of labor and capital to the soils already under tillage, he did not consider it unreasonble to conclude that it will eventually double the wealth, prosperity, and population of the kingdom. These opinions were corroborated by Mr. Shaw Le Fevre, M. P., who moved the second resolution; by Sir John Sebright, Bart. M. P., and various other gentlemen, who addressed the meeting.

Having labored for years, by means of the press, to awaken the attention of the agricultural community to this, in our opinion, most important subject, it is with great satisfaction that we are enabled to inform our readers, that, since the date of our last paper (December 1835,) the application of steam to the plough has been made a matter of practical and successful experiment. The following is a correct account, by an eye-witness, of the recent exhibition, near Bolton-le-Moors, of the application of steam to bog cultivation.

"The adaptation of inanimate power to the tillage of the soil must evidently have been considered by practical men to present almost insuperable difficulties, or steam would, probably, long since have been substituted for horses and oxen, as the motive power of agricultural implements. Certain light operations of the farm, such as thrashing, churning, chaff-cutting, &c., which could be performed by fixed power, have partially occupied the attention of mechanics, and suitable machinery driven by water, wind, or small steam-engines, has to some extent been advantageously used for such purposes. But the idea of a 'steam farm,' of a farm to be altogether cultivated by steam, in lieu of animal power, has hitherto been treated as visionary and absurd, except by a few individuals, and one or two agricultural societies, who have enforced, in their publications, the practicability and importance of applying steam to effect the more laborious operations of agriculture. This desideratum is at length accomplished. Mr. Heathcoat, M. P. for Tiverton, the ingenious and the well-known inventor of the lace machinery, has the merit of having conceived and planned this additional and remarkable contribution to science, and to the wealth of his country. The invention, after years of costly experiment, has been matured and perfected through the enterprising liberality of Mr. Heathcoat, assisted by the mechanical ingenuity and perseverance of Mr. Josiah Parks, civil engineer, whom he selected to carry his designs into effect. The first machine has been constructed expressly for the cultivation of bogs, and has, for some months, been practically and successfully worked in Lancashire, on Red Moss, near Bolton-le-Moors. During the Whitsuntide recess of Parliament, a numerous assemblage of gentlemen from different parts of the country attended to witness an exhibition of this novel and interesting invention; amongst whom were Mr. M. L. Chapman, M. P., Mr. T. Chapman, Mr. H. Handley, M. P., Mr. J. Featherstone of Griffinstown-house, Westmeath (an enterprising and successful bog-reclaimer,) Mr. F. Brown, of Welbourn, Lincolnshire, Mr. James Smith of Deanston near Stirling (well known to the mechanical world by his ingenious inventions, applied both to agriculture and manufactures,) Mr. B. Hick and Mr. P. Rothwell, engineer, with other experienced judges of mechanical contrivances. These gentlemen were unanimous in pronouncing the invention to be the germ of great improvements in the science and practice of agriculture, as well as eminently fitted for the particular purpose to which it has, in the first instance, been applied. Two ploughs of different construction were put in action, to the admiration of the spectators; particularly the one last invented, which is double-acting, or made with two shares in the same place, (?) so that it returns at the end of a "bout," taking a new furrow, without loss of time. The perfect mechanism of this plough—the action of the working coulters and undercutting knives, which divide every opposing fibre of the moss—the breadth and depth of the furrow turned over—the application of a new and admirable means of traction, instead of chains or ropes—together with the facility with which the machine is managed, and the power applied to the plough, especially interested and surprised all present. The speed at which the plough travelled was two miles and a half per hour, turning furrows eighteen inches broad by nine inches in depth, and completely reversing the surface. Each furrow of 220 yards in length was performed in somewhat less than three minutes, so that, in a working day of twelve hours, this single machine would, with two ploughs, turn over ten acres of bog land. The machine which bears the steam-engine is itself locomotive; but as the ploughs are moved at right angles to its line of progress, not dragged after it, the machine has to advance only the width of a furrow, viz. eighteen inches, whilst the ploughs have travelled a quarter of a mile; in other words, the machine has to be moved only eleven yards, in the time that the ploughs have travelled five and a half miles, and turned over a statute acre of land. This is, in truth, the prime distinguishing feature of the invention; it is the contrivance on which the genius of its author is more particularly stamped, and which seems to to be essential to the economical application of steam to husbandry; for it is evident, that were it requisite to impel the machine with a velocity equal to that of the ploughs, by dragging them with it, a great proportion of the power of the engines would be uselessly expended. Another valuable property appertaining to the machine, and which conduces greatly to its economy as a bog cultivator, is, that it requires no previous outlay in the formation of roads, no preparation of any kind further than a drain on each side of it. That a locomotive machine of such great dimensions and power could be so constructed as to travel on mere raw bog, was an excellence the more appreciated as it was unexpected by those persons who are conversant with the soft unstable nature of bog. The Irish gentlemen present also pronounced Red Moss to be a fair specimen of the great mass of the flat, red, fibrous bogs of Ireland, and that neither the machine nor the ploughs would have any difficulties to encounter in that country which had not been already overcome on Red Moss, the field of experiment. The engines are capable of working up to fifty-horse power, but the operations subsequent to ploughing will require a small force compared with that necessary for breaking up the surface of the bogs, to the depth and at the speed effected by these ploughs. The power consumed by each plough is estimated at about twelve horses, and the weight of the sod operated upon by the plough, from point to heel, is no less than three hundred pounds. The boiler is of unusually large dimensions for locomotive engines, being suited to the use of peat as fuel, so that the culture of a bog will be effected by the produce of its drains. At Red Moss, however, coals are so cheap, being found contiguous to, and even under it, that they are used in preference to turf. Eight men are required for the management of the machine and the two ploughs, or at the rate nearly of a man per acre; but it must be understood, that this number of men will only be required for the first heavy process, and has no relation to any subsequent operations in the cultivation of bogs, nor to the application of the invention to the culture of hard land. After passing a sufficient time on the moss to witness the exhibition of the ploughs, and the various other functions and properties of the machine, the party expressed to Mr. Heathcoat the extreme pleasure they had received, and their earnest hope that he would extend the sphere of his exertions by applying the invention to the culture of stiff clay soils; and more especially to carry into effect those important operations of subsoil ploughing and improved drainage recently introduced to the agricultural world by Mr. Smith of Deanston. To effect these processes, great power is essential, and it was evident that Mr. Heathcoat's invention was equally well adapted to them, and would be attended with results no less important than those which will arise from its application to the reclamation and culture of bogs."

It may be interesting to our readers to give a brief description of Mr. Heathcoat's patents for his invention of "new or improved methods of draining and cultivating land; and new and improved machinery and apparatus applicable thereto—which machinery and apparatus may be applied to divers other useful purposes.

"These patents were obtained for England, Scotland, and Ireland in 1832. Prolonged and costly experiments have been required to mature the invention, and adapt it to practical use as a substitute for animal labor in many expensive agricultural processes, particularly in the culture of wet, heavy soils. Its first application has been made to the reclamation of bogs, which of all descriptions of soil offer perhaps the greatest natural obstacles to improvement by mechanical means. These obstacles are, however, effectually overcome. Various machinery, constructed expressly for the cultivation of bogs, has, for some months, been practically and successfully worked in Lancashire on a bog called *Red Moss*, near Bolton-le-Moors. The principal machine is locomotive, and is so contrived as to be capable of travelling on the surface of bogs, the consistence of which would be insufficient, previous to a long and expensive drainage, for sustaining the weight of horses. The moving power is steam, generated from the peat and water of the bog itself. The diggings from the drains furnish abundance of fuel; and the drains yield an unfailing supply of water. The prime agent, steam, is thus obtained at the cheapest possible rate; the local fuel requiring no transport, and the water no outlay in reservoirs or other constructions, to ensure a constant provision. By far the greater part of the power of the engines fixed on the machine is available, and employed to actuate the ploughs or other agricultural implements. These are moved at right angles to the line of progress of the machine, not dragged after it; the machine itself remaining stationary whilst the ploughs are at work between it, and two small auxiliary carriages, in the manner to be presently described. In commencing the reclamation of a bog, a roadway is to be first traced out in a suitable direction for the proposed operations. This is done simply by forming two drains parallel with each other, and about seven yards apart. The principal machine is launched on this roadway. No metal or material of any sort is necessary for its solidity; the machine rests on the raw bog, and bears on so large a surface of it that its buoyancy is insured. It also consolidates and dries the roadway by its pressure. The two auxiliary carriages are stationed (where space permits) at a distance of about 480 yards asunder: one on each side of the principal machine, and parallel with it. Each carriage is furnished with a large wheel, or pulley, round which a band passes, proceeding from, and returning to, the principal machine, whence it derives its motion by proper apparatus. These bands are connected with the ploughs, or other agricultural implements, which are drawn to and fro between the machine and the auxiliaries. One quarter of a mile of land in breadth, exclusive of the roadway and headlands, is thus operated upon on the two sides of the machine. The auxiliary carriages travel on four wheels, resting on planks, which from a moveable rail road. One of the planks is let into a shallow trench cut in the bog, against one side of which plank some friction rollers, fixed on the carriage, press, in order to resist the pull of the engines. Ploughing is the first agricultural operation. To accomplish this process in a thoroughly mechanical manner, and to adapt it to steam power, it has been necessary to contrive peculiar ploughs, furnished with sharp working knives, which divide every root and fibre of the bog plants, to the depth of nine inches, and turn over a furrow slice of eighteen inches in breadth, completely reversing the surface, and turning the heather side downwards. The underlying heath, moss, and other bog-herbage, facilitates the discharge of water, and permits the rain and air to penetrate the furrows. Drains are formed as the ploughing proceeds, that the vast qantities of water liberated by that process may be immediately carried off. After lying a few months in this state, exposed to the action of the atmosphere, the ploughed surface is found to be so considerably pulverized, that little remains to be done to fit it for the reception of grass-seeds. The complex operations necessary to prepare the soil for the culture of other and more important crops than grasses, will also be materially simplified and economized by awaiting the natural decomposition of the soil, which is so greatly expedited by this system of ploughing as a first process. It establishes a general under-drainage, which, with the assistance of numerous shallow gutters discharging into proper drains, will speedily create a soil on the surface of the wettest bogs. The machine and auxiliaries remain stationary during the time occupied by the ploughs in taking two furrows; they are then, severally, put in motion, and made to advance in three parallel lines, in order to keep pace with the breadth of land turned over, and to pull the ploughs accurately straight. The machine is impelled by the engine, and each auxiliary by its attendant man, who also shifts on his planks as occasion requires. The machine and its auxiliaries have thus to be moved over a space of eighteen inches only, whilst the ploughs have travelled 440 yards, and turned over 220 square yards of land nine inches in depth; in other words, the machine and auxiliaries have to be moved only eleven yards in the time that the ploughs have travelled five and a half miles, and turned over a statute acre of land. The ploughs perform their work at the rate of two miles an hour, and are subject to very few stoppages; so that eight acres and three quarters, nearly, of bog would be ploughed up in a day's work of twelve hours, or, taking the average of daylight throughout the year, and making a liberal allowance for hinderances from weather and other causes, one machine would plough up 2000 acres in a twelvemonth. It is evidently impossible to state, with any approach to accuracy, the expense of draining bogs, as the number, nature, and dimensions of the necessary drains vary with the wetness, retentiveness, and other qualities of each particular bog. The cost of draining will be materially reduced by applying steam-power to suitable draining implements. In like proportion the expense of all other processes in husbandry will be diminished. The power of the engines will be used in conjunction with portable railways, for the conveyance of marl, and other kinds of manure or manuring soils, on the land. By these means, proper times and seasons can be selected for performing the various farming operations, the poaching (or injuring from the treading) of horses will be entirely avoided; open drains, where preferable, may be substituted for covered ones; and no outlay will be required for roads. The land necessarily lost by farm roads and communications between fields will be consequently saved to the occupier and the public, as the machine roadways will be laid down with grass, and thus become permanently productive, instead of being not only a positive loss, but a source of continual expense and trouble."

We now come to give some account of Mr. John Upton's steam-plough, noticed in our last paper, and for this purpose we will quote from a prospectus in which that able engineer and mechanist has set forth some of the advantages which he considers the agriculturists will derive from his invention. Mr. Upton is at present building a steam-plough, which he expects will be finished in time to enable him to exhibit his capabilities before the prorogation of parliament. Of late his factory* has been visited by many county members and practical agriculturists (amongst others by Sir Reg. M'Donald, S. Seton, Bart. Hon. Secretary of the Highland Society,) who have expressed themselves highly satisfied with the appearance of the machine, is lightness, compactness, strength, and manageableness. Mr. Upton has executed with the greatest credit to himself various important public works, and is a practical engineer and mechanist of forty-five years' standing. The strongest expectations therefore are entertained that his steam-plough on trial will realize the favorable opinions that are formed of its efficiency.

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* No. 7. New Street, Southwark, London.

"This steam-plough is worked by Upton's patent lever steam-engine, and his air furnace boiler. If a single shared plough, the space occupied by the entire machine will be four feet long by ten feet; if for trench ploughing, the dimensions will be the same; if for ploughing two, three, or more parallel furrows at once, the breadth and length will be about five feet by twelve feet. The work done by the trenching plough will be equal to any spade husbandry; and that by the parallel shares will be found very superior to any horse ploughing; inasmuch as the ground will not be trod and rammed down by horses' feet; and as the steerer or ploughman, &c. will ride on the machine, the land will be left as open and light as possible, and resemble that of garden culture. To the steam-plough a harrow, drill, and seed-box can be attached when requisite, and the entire operation performed at one going, when it is for the last ploughing, without trampling the soil. The spots left in the angles of the field by Upton's steam-plough will be smaller than by any horse-plough, as the steam-plough will turn, if a single share, in thrice the breadth and length of a common wheelbarrow; and if a three-shared plough it will turn in the space of a small one-horse cart. The simplicity of construction and small number of parts composing this steam-engine and boiler, and the great safety and security of the latter, will prevent the necessity of frequent or expensive repairs, as the only parts of the apparatus most liable to wear and tear are the ploughshares, the soles, coulters, and harrow tines, which will only require the same repairs as if drawn by horses. The engine and its boiler is calculated to go 50,000 miles, or more, before any repairs could be wanted, unless from accident or unfair usage, and whenever, from long use, very much worn, if the boiler were to burst, it could only extingush its own fire without injury to any person close to it. The plough will require one steady man to direct or steer it, and a tractable boy to attend the fire and turn the steam off and on occasionally, the engine being of the most simple and efficient construction. The water-tank will require replenishing now and then, and perhaps fuel will be required two or three times in the course of the day, and the boiler is admirably constructed for burning either wood, peat, or coke, or coal may be used. The single plough is calculated to do two acres per day, and as the person will not be fatigued by walking over the rough ground, nor have any horses to rub down and feed after coming home from the field, they could remain out a longer time. The double plough would do four acres, and the three-shared plough would do about six acres per day. The counter or trench plough would do about two acres per day; but as it would be equal in power to the double shared plough it would require the same quantity of fuel and expense. The land cultivated by this plough would doubtless be found from its efficiency to produce crops nearly if not quite equal to spade husbandry, with which mode of cultivation I am thoroughly well acquainted from practice; and it would in such cases pay for the steamer the first season. As to the expense, there would be required one good steady ploughman, who never ought to receive less than 2s. 6d. per day, and a tractable boy or lad as firemen at 1s. per day, as thus:—One man per day, 2s. 6d.; one boy, 1s. per day. If coke is used as fuel, I shall state it at the London prices, although in many districts it is much lower, therefore, the single plough would require about twelve bushels per day, which, at 6d., is 6s. Ploughing two acres per day at 4s. 9d. is thus 9s. 6d. Now, it will appear manifest that if two acres can be ploughed per day with a single shared plough for 9s. 6d., six acres per day could be ploughed at a cheaper rate, in proportion, inasmuch as there would only be the same number of people employed as before:—Thus wages per day, as before, 3s. 6d.; fuel per day, as before, 3s. per acre, 18s.; ploughing six acres per day, at 3s. 7d. is thus £1: 1: 6. As the ground would not be trodden and rammed by horses or men in the various operations of ploughing, harrowing, sowing &c. there can be no doubt that superior crops would be obtained, and in some soils deep ploughing is very beneficial, which could be done by steam better than by horses, for steam never tires; and as for treading the ground it is generally very detrimental, for I have frequently observed that in some soils, wherever a horse's foot hole is left, corn seldom thrives to well, and in many instances in retentive land and cold seasons, perishes. I once had a good field of six acres of wheat entirely ruined and destroyed by a posse of horsemen who lived many miles away from my farm hunting in my fields; to complain was useless, and as to purchasing law, what farmer or tradesman can afford to pay for it?

"As to the expense of ploughing with horses, there is much variation, some soils requiring only two, some three, and some four; it will be fair therefore to take three as the average number. Now I took great pains to measure and find what was the lowest expense of my horses' keep for three or four succeeding years, and it amounted to twenty pence per day each, which is, I believe, five pence more than now is allowed for the the keep or starvation of a poor old worn out ploughman, or his master, for one entire week! Therefore a single team of three horses cost per day (and generally ploughed near an acre) 5s.; my ploughman received per day, 2s. 6d.; the driver, 1s.; in all, 8s. 6d. An acre of land, if ploughed by steam, would cost 3s. 7d. Difference per acre, and better work done, 4s. 11d. Although a good and perfect steam plough may be thought a very desirable machine for the West Indies, Canada, Australia, and the colonies generally, yet, unless it would do something more than plough and harrow, I thought it would not be approved of, and from my own practice in farming I know what is wanted by a farmer; and being by profession a steam-engine manufacturer and mechanist, think I know, or am more likely to know, and to produce what will answer the farmer's purpose much better than some of those itinerant philosophers, travelling speculators, and *soi-disant* steam-plough makers, who have been to my factory to endeavor to see what I was doing; but in vain, for I would show and explain nothing to them. Wishing to produce a machine of the utmost simplicity and general utility, I have so contrived my locomotive engine, that I can detach the ploughs, &c. from it, and send it away to the fold yard, where I will suppose there is a common dung-cart ready loaded for it to take away. My locomotive would take the cart to the field, where the steerer would have to tilt it in the usual manner, and then draw out as much manure to form one heap as he pleased—to form as many heaps as he pleased, or to tip and shoot the residue, or the whole load at once if required. The steersman would then take back the empty cart at a trotting pace, if he chose, and fetch another loaded one.

"The expense of hauling manure it is requisite to calculate from some given data, in order to ascertain the expense; and having, in the course of many year's practice as an engineer, paid as much for the hire of horse and cart work as almost any practical man in this or any other kingdom, besides keeping several good teams of my own, I shall go as near the wind's eye as I can carry sail, and assume a distance. Say the average distance is one-third of a mile out, and one-third of a mile back, and that the time taken up in tipping the load and exchanging carts would be equal to one-third of a mile more, making one mile in time and distance per load. Now, as my teams for years regularly did 20 miles of ground per day, when hauling on the road, and I generally put on 20 loads per acre at a dressing, it would amount to 20 loads or 1 acre per day, at only two miles per hour, average time for one team; therefore say—team per day, 5s.; one man to drive and tip, 2s. 6d.; by horses per day or acre, 7s. 6d. Now my steam-engine, if not very hilly ground, would go at four miles per hour, or 40 loads per day, which at the same per day for man, boy, and for fuel, comes to 9s. 6d., the half of which is, per acre 4s. 9d. I shall not notice the filling of carts or spreading the manure, as in either case, whether of steam or horses, the expenses are the same. My locomotive engine would take the carts, &c. loaded with produce to market, at four miles or more per hour; and I think it might be so modified by further improvements as to be made subservient to many of the farmer's wants. It might perhaps be made available for the cutting of roots and fodder for stall-fed and other cattle; for the thrashing, winnowing, grinding corn, and pumping water, &c. In case of the last ploughing, when it is intended to sow and harrow in the seed at one going, the same power would effect the whole work, only requiring the aid of the boy, who must otherwise be engaged in driving the harrow horses, but which, horse labor and horse injury done to the soil would be done away with, and a further saving per acre effected by my steamer. The additional boy at the steam-harrow would be required to lift up the harrow occasionally, and take up the weeds, and put them in a basket hung to the machine, until arrived at the headland, where a spare cart might be placed to receive them, and which the engine would take out of the field every evening, or as many times per day as was necessary. As to the quantity and quality of work which such a steam-engine would do when compared with animal power; I shall assume a regular breadth for the furrow slice of eight inches, and from four to nine inches deep, according to the tenacity and stony qualities of the soil. At the above breadth, but at less depth, a horse-plough would make as many bouts per acre as would amount to twelve and a half miles, exclusive of ridgings and balks. My steamer would go twice as fast, and being more easily managed and controlled than horses, would not be so liable to get out of line, and would, I think, do the work better, besides not having the fatigue of walking. I shall state what such a steamer would do upon a farm of 200 acres of arable land, premising that it would cultivate a much greater farm where desirable, and leaving the intelligent farmer to calculate the purchase and maintenance of the necessary horses, harness, plough-gearing, ploughs, harrows, &c.

Ploughing 200 acres per annum once over,	at 3s. 7d. per acre,		£35	16	8
" 150 do., and harrowing again 2d time,	do.	"	26	17	6
" 150 do., and harrowing and seeding again 3d time	do.	"	26	17	6
" 50 do., fallow 3d time,	do.	"	8	19	2
" 60 do., hauling manure	4s. 9d.	"	14	5	0
" 60 days do. to market	6s. 10d.		20	10	0
" 30 do. harvesting (long days)	10s.		15	0	0
" 90 half days, equal to 45 days cutting fodder, &c.	4s. 8d.		10	10	0
			£158	15	10

"I must premise that my preceding calculations both of horse and steam tillage, do not contain the usual incidental expenses of filling carts and spreading manure, inter-furrowing and water-furrowing, draining, weeding, hoeing, &c.. none of which has been incorporated with the ploughing, harrowing, and hauling. Again, my scale of horse expenses is drawn from my own plan of keep, which proved so rational and beneficial to both cattle and owner, that I shall never adopt any other system, which was this:—I knocked down all the racks in my stable, but left the mangers; I cut clean sweet wheat and barley straw, with equal weights of best sweet hay; to this I added three-fourths peck of bean and oatmeal per horse per diem, which was well mixed up, and moistened with water out of a gardening can with a rose-head. I put a small handful of salt for each horse into the mixture, and when I could get carrots to chop up small, I added them, and deducted half the bean meal. As soon as the horses came in from work, a very small quantity was spread thin in the manger, and when this was *eat up quite clean*, another lot was put in, *so that there was no waste*—their bellies were soon filled, and they had time to lie down and rest. No man's horses worked harder, and no man's teams were in better condition; they were occasionally turned out to grass in the meadows on Sundays and during warm nights This cost me 20d. per day each, the year round, and on this plan I found my calculations of horse-keep. I think 200 acres, all arable land, would require 10 horses for tillage, with four men and two boys per annum, if the land is to be well worked and kept going, besides other hands for occasional works.

Therefore 10 horses kept at 20d. per day each, is per annum,	£303	6	8			
Ditto wear and tear of harness and shoeing, per annum,	45	16	8			
	£349	3	4			
Four good men and two boys, as before,	218	8	0			
				£567	11	4
Now, by my steamer, the expense of tilling 200 acres would be, as before stated,	£158	15	10			
To which may be added, one additional man and a boy, all the year round, at the same wages as before,	57	5	0			
And one pair of oxen, for furrowing, ridging, and earthing-up, and sundry other purposes, at 20s. per week the pair,	52	0	9			
				268	0	10
Saving in the tillage of 200 acres of arable land, per annum,				£299	10	6

Say purchase of 10 horses for 200 acres arable land, at £25 each,	£250
Do. for harness, plough-gearing, and for ploughs, harrows, &c.	100
	£350
Purchase of one of my locomotive steam ploughs, with two shares,	£350
	£350

"As the quantity of land in cultivation, whether by the plough or in grass, much diversity of opinion exists. One author makes his statement for England to be only 11,525,000 acres which I think is enormously below the truth; another, more than double the quantity in aration alone! But, during the past week, at a meeting in Bath, for a most excellent purpose (*God knows too long delayed,*) that of allotting small portions of land to laborers, for spade cultivation, it was there stated by Dr. Parry, that England alone contained 29,000,000 of acres of cultivated land; and from all I have read on the subject elsewhere, I think that 22,000,000 of acres may be assumed as the probable quantity under the plough. If we allow the above, for the sake of showing how steam would benefit the agriculturist, as it has already done the manufacturer, I shall apportion 20 acres of arable land to the labor of each horse as before, with the accompanying number of attendants; then, supposing that a period should ever arrive when all the arable land shall be worked by steam, we shall have as follows, viz. in England:

22,000,000 acres of arable land, tilled by horse labor, at an expense of £567: 11: 4 for 200 acres, which is a fraction above £2: 15: 8 per acre, and amounts to the sum of	£62,150,000	0	0
The same, if cultivated by the aid of steam, at £268: 0: 10 for 200 acres, would, at £1 11s. 9½d. per acre, amount to	34,970,823	0	0
Annual saving to the agriculturists,	£27,179,177	0	0*"

That the steam-engine would, at no very distant day, supply the place of animal labor in agriculture, and become as mighty an instrument in augmenting the productiveness of the soils, as it has proved in creating and economizing manufactures, in navigating the ocean, and in travelling on land, was many years ago predicated by Franklin—a predication reiterated by Davy, and latterly acknowledged and enforced by many distinguished agriculturists. The successful application of Mr. Heathcoat's invention to the culture of bogs—the most repellant and obstinate of waste land—leaves no doubt of its applicability to soil already in cultivation. Coals are now procurable throughout Great Britain, at prices which have caused the steam-engine to be extensively introduced as a substitute for animal labor in many of the processes connected with husbandry. Thrashing, cleaning and grinding corn, hay-choping, turnip-slicing, &c. are now performed by small engines fixed on farm premises; even the churn has its steam-engine managed by the dairy-maid; and so great is the advantage arising to the dairy farmer, from the regularity of motion, and economy produced by it, that hundreds of small engines for this familiar purpose alone, are used in the north of England, and in Scotland. But these are humble savings compared with the benefit to be derived from the vast steam power which may be brought to bear on the soil itself. Those agriculturists who are acquainted with the effects produced by the valuable subsoil plough recently invented by Mr. Smith of Deanston, will readily appreciate the importance of an invention which will enable him to employ that kind of plough at a much diminished cost per acre. Mr. Smith's plough, with steam power, will effect a revolution in agriculture. Implements of husbandry have hitherto been restricted in form, weight, and dimensions, to the powers and manageableness of a team of horses. A new class of instruments will take their place; the stiffest soils may be broken up and pulverized to any desired depth; strong clays, the natural wheat lands, may be profitably cultivated, rendered more fertile, and fitted to bear a better, and more systematic rotation of crops.

Such are a few of the benefits which landowners and agriculturists will derive from the substitution of steam for animal power in husbandry. It is also no slight advantage, in a national point of view, that this important change will be effected, unacccompanied by any of those temporary evils which too frequently attend the application of mechanical discoveries to existing arts. This invention will not displace a single human being from his accustomed healthy occupations; it will restore to the support of man a considerable portion of that large amount of produce now sacrificed to the maintenance of agricultural horses—it will furnish employment to the rapidly increasing rural population of the empire, by rescuing millions of acres of bog and waste land from obnoxious sterility—it will fix on their native soil multitudes of those poor Irish laborers who annually migrate to Great Britain in search of work and food, and who are forced, with numbers of our countrymen, to suffer the hardships and dangers inseparable from emigration to wild and distant regions.

The horses in Great Britain are said to amount to 2,000,000, each consuming annually what would be sufficient to support eight individuals—16,000,000 in all. Their entire displacement by mechanical means, would, therefore, in effect, be to add another island, large as Great Britain, with all its resources for human sustenance, to the seat of empire! What an insight does this give us into the indefiniteness of that divine command which was breathed in Paradise as a blessing over our race, "Increase and multiply, replenish the earth and subdue it." Have we subdued the earth? Can we subdue it? How does this incentive to rural activity—the precept of that *Parent of Good* whose intention it is that the mouths of all his children shall be filled with food, and their hearts with gladness—meet and overthrow the dogmas of those who have said to population and productiveness, "Hitherto shalt thou come, but no further!" Mind shall indeed achieve her noblest triumph, when she shall no longer be confined to accommodating matter for the use and the comfort of man; but when she shall direct what in reality is a substance impalpable as the breath of heaven, to purposes which shall feed the hungry, clothe the naked, give employment to the idle, and, supplementing the energies of exhausted Britain, shall bid her, in renovated splendor and renewed age, walk on innoxious to that inherent decay which has put down in rotation all the extinct monarchies of the past, and bid her rival for ages to come, in extent of production, upon the petty surface of a few million acres, the limitless domain of her once western world.

We are happy to observe that the press of Scotland has of late been advocating the advantages to arise from steam husbandry; and we trust the time is not distant when the Highland and Agricultural Society will offer a liberal premium,[*] *not for an effective steam-plough*, but for the first company for building steam-ploughs and hiring them out to the neighboring farmers, that shall successfully introduce this new branch of industry into Scotland. If some spirited agriculturists—for instance, the Marquis of Tweeddale, Lord Greenock, and Mr. Menteith of Closeburn—in their respective neighborhoods, would patronize the formation of such companies, each to commence with a capital say of £20,000, steam agriculture would simultaneously and extensively be introduced into the east, south, and west of Scotland. But if this invention were left to private and individual enterprise, in the present depressed condition of our farmers, half a century would elapse before its use would become general. Let our tenantry press this subject upon the attention of their landlords in their respective counties. What a relief in these times it would be, if each farmer, instead of keeping four, six, or more pair of horses, had only to send to the next village for a steam-engine, to do the work for which he has to feed and attend them during the year!

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* Our Scottish agricultural readers will easily perceive that these calculations are founded on the rates of English labor and wages. We are quite satisfied that ploughing in Scotland with horses does not exceed the cost of steam-ploughing as given above, namely, 8s. 7d. per acre; but then the food at present consumed by horses would go to the support of human beings, were inanimate power substituted for animate. Would not such a result be beneficial to a populous country like Great Britain?—*Editor.*

EFFECTS OF LEGISLATIVE AID TO AGRICULTURE IN THE STATE OF NEW YORK.

No. I.

[The private letter to which the following interesting communication is in reply, was written last spring, soon after the refusal of the legislature of Virginia to do any thing asked for by the Agricultural Convention, in aid of the promotion of agricultural improvement. We then supposed that a statement of what had been done for that object in New York, even though but partially successful, might furnish light, and either examples or warnings, to the friends of agriculture in Virginia, and especially to our legislators: and we therefore applied to our valued correspondent for the information desired, believing that no one was better qualified to furnish it, or was a more judicious or more zealous friend, to the true interests of agriculture. His answer has been delayed until now, by his ill health and absence from home. It is hoped, notwithstanding the lateness of the publication, that the facts stated may have some beneficial influence on the deliberations of our legislature now in session.

To those who have read the communication of Dr. Beekman to the first volume of the Farmer's Register, or who know him at home, it will be altogether unnecessary to say that he stands high, both as a successful practical cultivator and improver of the soil, and a scientific agriculturist. His continuation of this subject is promised very soon, and will appear in our next No. When concluded, we may offer some of our own views as to the manifest defects, as well as of the very great benefits, of the system adopted in New York for aiding agriculture by legislative encouragement.]—ED. FAR. REG.

To the Editor of the Farmers' Register.

DEAR SIR:—In your letter to me you say that "efforts, as yet ineffectual, have been made, and will be continued, in Virginia, to induce the legislature to aid in the diffusion of agricultural knowledge. In New York that attempt was formerly made, and, I believe, has been recently renewed, and in a different manner. It would be of much service to us to have a plain and sufficiently full narrative statement of what was actually done—what were the effects, good and bad—and your comments at length on what was correct and useful in effect, and what was injurious or defective in the system, as well as the recommendation of any better system, or particular measures. In treating this subject, you will have the advantage of experience added to all your other lights. No man can tell, from seeing a law on paper, how it will work in practice; and it is the actual working, and effect or non-effect of your experiment, that I want."

To comply with your request is simply to state, first, what has been done in this state by legislative enactments for the encouragement of agriculture, and the reasons for it: secondly, what have been the practical effects of those enactments upon the prosperity of our farming population. This, I think, embraces the whole subject. To the first part I will now draw your attention.

You are aware our staple productions of the soil are wheat, corn, oats, rye, and barley, and our attention has been most directed, and the quantities grown, according to the arrangement here made, beginning with wheat. You will see at once that so much grain-growing is exhausting to the soil, and it required more skill than our farmers possessed to keep up the production with the increase of population, and not impoverish their farms. Our forest lands, when first cleared, will always, and for several succeeding years, produce fine crops. But when these crops, although varied, were continued annually for a length of time, their intrinsic worth became inadequate to supply the exigences of their owners, and there was naturally a depreciation of produce, and consequently in the value of their farms. These effects were early noticed in this state. Many patriotic gentlemen suggested different plans as remedies, but none appeared so feasible as associations formed under legislative sanctions, for the collection and diffusion of agricultural intelligence. Some of these enactments were local in their application, but others were designed to operate throughout the state. In 1793 a law was passed, designated as "an act for the promotion of agriculture, arts, and manufactures," which was remodelled in 1804 and called "an act to incorporate a society for the promotion of the useful arts." Its objects were general and indefinite. In 1809, was passed, "an act incorporating the Society of Dutchess County for the promotion of agriculture and rural economy;" and subsequently different acts for the benefit of different counties in the state. Under these several acts I am not aware that much was done for the promotion of the objects expressed in their titles. In 1819 a law was passed entitled "an act to improve the agriculture of this state." The material parts of this act of which we wish to avail ourselves are in the words following:

"*An Act to improve the Agriculture of this State.*

[Passed, April 7th, 1819.]

1. "Be it enacted by the people of the state of

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[*] The society has placed £500 in the hands of the directors, to be appropriated to this purpose in the manner they may conceive most likely to secure the object in view.—*Editor.*

New York represented in senate and assembly, that the sum of $10,000 per year, for the term of two years, from and after the passing of this act, shall be, and is hereby appropriated for the promotion of agriculture and family domestic manufactures, within this state; that the said sum shall be distributed among the several counties of this state, in the manner following, to wit: [Here follows the apportionment to the several counties in this state.]

2. "And be it further enacted, that whenever an agricultural society shall be formed in any one county, or in two contiguous counties, and the members thereof shall annually procure, or raise by voluntary subscription, any sum of money, the president and treasurer shall make and subscribe an affidavit of the facts of the formation of such society, and of their having raised a certain sum, specifying the amount thereof; which affidavit shall be filed with the comptroller of this state, who shall draw his warrant on the treasurer, for the payment of a sum, equal to the amount of such voluntary subscription; not, however, in any case exceeding the amount to which such county or counties would be entitled, according to the apportionment aforesaid.

3. "And be it further enacted, that the several agricultural societies which may be formed in this state, shall elect such and so many officers as they may deem proper, all of whom shall be practical farmers; none of whom, however, shall receive any emolument from his office; and it shall be the duty of such officers annually, to regulate and award premiums on such articles and productions as they may deem best calculated to promote the agricultural and manufacturing interest of this state.

4. "And be it further enacted, that each person to whom any premium shall be awarded for any agricultural product, shall, before the receipt thereof, make as accurate a description of the process used in cultivating the soil, and in raising the crop, or of feeding the animal, as may be; and shall, in all cases, describe the nature of the soil, the kind and quantity of the manure, the state thereof, and time of the year in which applied, and deliver the same to the president of said society.

5. "And be it further enacted, that the several presidents of the said societies, shall, annually, within one week after the annual meeting of the legislature, transmit all such reports or returns to the office of the secretary of state, to be by him kept safely, till demanded by the Board of Agriculture, herein after named and organized.

6. "And be it further enacted, that the several presidents of the several agricultural societies, or a delegate to be chosen by each of the said societies, shall form a board of agriculture for this state; who, on the first Monday after the annual meeting of the legislature, may convene in the capitol, in the city of Albany, any five of whom shall form a quorum; may elect a president, secretary, and such other officers as they may think proper; receive and examine all such reports and returns as aforesaid, and select for publication, such of them, and such other essays as they may judge advisable, and shall annually publish a volume at the expense of the state, to be distributed by means of the said agricultural societies, to the good people of the states, not exceeding fifteen hundred copies of such volume; which president and secretary shall continue in office during the continuance of this act.

7. "And be it further enacted, that the treasurer of this state, shall, annually pay, on the warrant of the comptroller, to the said board of agriculture, $1000, to enable them to purchase and distribute among the several agricultural societies, such useful seeds as they may deem proper, and to defray such other necessary expenses to promote the object of this act, as are not otherwise provided for; and said board shall annually account with the comptroller for the expenditure of said money.

8. "And be it further enacted, that it shall be the duty of the secretary of this state, as soon as may be, to cause this act to be published in at least one newspaper printed in each of the great districts of this state."

You will notice that this act was to remain in force for only two years; before the termination of that time, however, another act was passed, extending its operation for four years, in addition to the first term. This first act, required the organization of county agricultural societies, who were authorized to draw a certain amount of money from the treasurer of the state, provided they raised an equal sum from among the members of the society or others. The joint sum so raised, they were authorized to distribute in premiums to objects deserving of them. The farther operation of this law, was to organize an agricultural board, under the officers of the county societies for the state. This board was required annually to receive and examine all essays and reports, and to publish such as were advisable in a volume at the expense of the state, to the number of 1500 copies, which were to be distributed to the people through the country societies. An appropriation was likewise made of $1,000 annually, to enable the board of agriculture to procure suitable seeds for distribution, through different parts of the state.

These are the principal acts that have been passed for the encouragement of agriculture up to 1830, in this state; and as the act of 1819, only extended to six years, that is from 1819 to 1825, when it expired by its own limitation, it will be with reference to this particular act, that I will state its effects as far as my observation extended.

Almost all the countries in the state organized their societies under it. As I have had no peculiar opportunities to become acquainted with its effects in other counties than my own, which is Columbia, on the North River, and as it is but fair to conclude that its objects being for the benefit of them all, its operation would be but little varied in each, permit me to give you a succinct history of its operation here. Its organization was hailed as a happy omen to our farming population. They were at that time suffering under the re-action of the high prices for land and produce of the war of 1812. Wheat was worth but about 75 cents per bushel, other produce in an equal ratio, and our best farms which had been worth $50 to $60 per acre, had fallen in price to about $25. All, therefore, suffering under the despondency created by these causes, felt that something must be done to revive the drooping spirits of the farmer, and enable him to pay his debts, and make provision for his family. It was generally acknowledged, that to do this effectually, was first to improve the system of agriculture, which it was hoped, the wisdom of the legislature would effect, and that object obtained, the establishment of manufactures next would create a greater demand for those products, and of course, enhance their prices.

It was under these circumstances that our society commenced its operations. Premiums were offered, of from $1 to $10, for the first and second best specimens of each of our staple productions, having a reference to quantity as well as quality: but in all cases, the appearance, as well as yield, was to be above the ordinary standard, and its method of cultivation stated in a communication. Premiums were likewise offered for the exhibition of the best specimens of horses, cattle, sheep, swine, farming implements, and domestic manufactures, with a distinct and greater premium for the best cultivated farm in the district. For the purpose of awarding these premiums, committees of the members of the society were appointed. The principal farmers pretty generally enrolled themselves as members for the first two or three years. It was then observed, that although the distribution of premiums had been general throughout the county, and the good effects of the society were manifest to all, because new life was diffused throughout our whole population, and a general desire to excel in the several departments of agriculture, with a view to the attainments of the premiums—yet, as there were intelligent and leading farmers who, under every previous discouraging circumstance, were first in their neighborhoods, and who would naturally be the first to improve, and more than keep pace with their hitherto sluggish neighbors, who were now to become competitors—and who, according to the course of things, would annually bear off but a small portion of the premiums from the others—and as the first were but few in number, though scattered through the county, and the latter many—it is easily seen, that from the want of success, much the larger number would be disappointed. If these effects had lasted but for a year or two, it would not have given rise to much complaint; but of this class, a successful competitor one year, was commonly successful the succeeding year, and the premiums were necessarily taken by a few men. From this cause arose jealousies, and the law, among the many, became unpopular. At the expiration of the time for which it was last enacted, it was, consequently, not renewed. As I was not a member of the society, and of course took no premiums, I trust I was at least a disinterested spectator of its effects. Such was the operation of the law among the farmers generally. I will now give a concise history of its effects upon their agriculture. At the organization of the society, I think I have before observed, that it was in a low state. The quantity produced was small, its quality inferior—our cattle and horses illy attended to—sheep-husbandry scarcely known, and worse practised—our farms gave us but a scanty support, and houses little comfort. As illustrative of one fact, I distinctly remember one of our most enterprising and intelligent farmers observing to me, that we could not raise good clean wheat. There would be always a little rye, cockle, smut or chess in it—it was unavoidable. But when farmers were brought together at our fairs, by competition, when they saw that better articles could be produced, and that to succeed themselves, more care must be used in the selection of their seed, more judgment used in its tillage to insure a heavy crop, and skill in preparing it for market—that the way to acquire this intelligence, was to mix with the best practical farmers in the country, acquire a knowledge of their superior management, and then profit by it. The same gentleman who made to me the observation alluded to, was so far benefited by this diffusion of information, that he became one of the most successful wheat growers, both in quality and quantity, in this county; and he occasionally in subsequent life alluded to his former mistaken notions of its cultivation. I have made the allusion to this particular branch of agriculture simply to show its effects in this case upon one of our productions; but when those productions extend to all those raised by the farmer, for it would have a like effect upon each, we must come to the conclusion, that the spirit of competition and rivalry created the desire to become acquainted with the best method of raising all our agricultural products—of having it said that we had the best cultivated farm, the best arranged barns and out-houses, the best agricultural implements; that we raise more and better wheat, corn, oats, rye, or barley, upon less land than others; that we had the best stud of horses, or drove the best pair; that our hogs were the fattest, and cost the least; our cattle the finest, and most profitable, and our sheep bear competition with any other, and the independence of feeling and practical comfort growing out of any or all of these advantages. If these were any of the effects derived from agricultural societies, we must admit they were highly useful. The spirit of improvement is still somewhat rife among us. What gave it first the impulse, unless it was the excitement created by competition, I know not. For more than ten years our county society, under the law of 1819, has ceased to exist; but many of its fruits have not yet been gathered. We see it in the improved and improving conditions of our farmers: all around them denotes comfort and increasing affluence—the envy and jealousy with which they looked upon professional men has disappeared, for they are engrossing a large portion of the wealth of the community. Fifteen years ago it was a rare sight to see a farmer riding in his carriage: now it is neither novel, nor is the number few that do and can afford it. We see too, many of them selling their farms, and retiring upon the fortunes created by their industry and care. It may be asked, can their successors receive the interest upon their investments, buying farms at $100, and often more, per acre? I answer, yes. The solution is as easy as it is practical. Take, for instance, an acre of land producing wheat; it will not take extraordinary farming, in ordinary seasons, to produce twenty bushels to the acre; this at present prices, would be over forty dollars worth of produce from it. Deduct one-third of the nett proceeds, for all the expenses of cultivation, and it will leave $26 66⅔ profit, giving nearly the interest, at 7 per cent. of $400 to the acre. Take oats, producing an average, neither large nor uncommon with us, of 40 bushels per acre—(we sometimes have 60 or 70—) this at present prices would be $20 per acre. Deduct again, one-third for expenses, would leave $13 33⅓, or the interest of nearly $200 per acre.

Take corn, and allow 40 bushels to the acre—this will be equal to $40, and give the same result as wheat. Rye will give about the same, or rather less profit than oats, or the interest upon $200 per acre. Barley will give as much as oats—potatoes and turnips at least double that of wheat or corn. Meadow land at 2 tons of hay to the acre, and worth $12 per ton, would leave a nett profit of $16, which would pay the interest upon nearly $250. Pasturage would take in the remaining portion of the farm, except the woodland. This would leave a profit not as large as either of the others, but still enough to make the investment a good one. You will observe that in all cases, I make a deduction of one-third of the nett proceeds for the expenses of cultivation. A long experience has taught me that where a farm is worked for a part of its produce, or by men hired for that purpose, this portion will pay all necessary expenses. It is as near to a rule as any that I can adopt; and whichever way I manage, I have always found the allowance ample. Although we feel that farming is much more profitable now than formerly, and that the increased product gives more value to our real estate, yet we frankly acknowledge that we are only tyros in our profession, and confess our ignorance and inefficiency in many things. From what has been done by a little effort, we have only a foretaste of what may be done, and we are desirous for further advancement, as there can be no doubt that the products of our soil may, with more effort, in time be doubled. I will not say that our former county agricultural society has produced these results, but it has contributed to them, I have no doubt. Still it did not meet the expectations of its friends; for when the state bounty was withdrawn, it languished and died. Had it been all that was desired, it would have sustained itself, overcome the opposition of its enemies, and diffused an extensive and prevailing opinion, that it could not be dispensed with.

You will notice that under the law of this state, of 1819, a board of agriculture was formed, whose business it was "to collect essays and facts, and to publish them annually in a volume for distribution." The board attended to the performance of this duty, and issued in all, I think, three or four volumes of about 500 pages each. I had the good fortune to obtain three of them, and to say that I was gratified by their perusal would be only giving them a kind of negative praise. I have read them again and again with both renewed pleasure and instruction. Several of the articles emanating from practical men, and evidently unused to writing, still contained many clear ideas that bear strongly upon the subject on which they treat, and are extremely valuable to the farmer, because whilst they excite a spirit of emulation, they show him how he may improve in following out many of the details of a laborious profession. There are others again drawn up by more scientific and practised pens, that would do credit to the first men of the age. It was the reading of these volumes that first gave me a taste for farming; and if the state had issued and distributed 15,000, instead of 1500 copies of each volume, it would have added millions to the wealth of her people.

I trust, Sir, I have followed out the law of 1819, and its subsequent extension to its practical effects. That it was not all that was desirable, will be readily acquiesced in: but that it has been very beneficial to our farming interest, I think, will neither admit of equivocation or denial. What has been done by legislative sanction since its expiration will be the subject of another communication.

Before I close, however, I must be permitted to say that the people of this state are greatly indebted to some of our private citizens for the zeal they have shown to aid the cause of agriculture, and the ready disposition of their purses to carry their designs into effect. Among these I must notice the late Chancellor Robert R. Livingston, who was the first president of our State Agricultural Society, and who by the introduction of merino sheep alone, and his essay upon the management of them, has added immeasurably to the value of our farms, the profits of our agriculture, and the establishment of our woollen manufactures. These are benefits so great and decided, that they cannot leave but one opinion of the prescience of the man whose efforts for the good of his countrymen have been so signally successful. Long may his memory be cherished, for he richly deserves it from us. We acknowledge a friend and patron likewise in the Hon. Stephen Van Renssalaer, who, being a large landholder himself, has always shown an interest, not only in the prosperity of his tenants, but of the whole community. The establishment of a school at his sole expense, for the study, in part, of chemistry, botany, and geology, as intimately connected with agriculture—the geological survey, made by his direction, of two counties in this state, with a view to the developement of their resources—his contributions to aid the dissemination of information in all the various ways in which it may be required—and his importation of the best breed of cattle, which have for many years been kept up, always affording a supply to our farmers who are solicitous to improve this valuable kind of stock—are so many proofs of his excellence as a man, and his philanthropy as a patriot. This list might be extended; but we must not omit the name of Le Ray de Chaumont, as one of our most public spirited citizens. I will only further add, that our successive governors have uniformly shown an interest in the advancement of agriculture; and have recommended the subject to our legislators, who, with few exceptions, seem not to comprehend it, and, of course, have generally been slow to respond to executive suggestions, and who seem to think that they are chosen to do the whole business of the community, except that which is to be beneficial to the farmer, who feeds, supports, and clothes them.

I remain your friend, &c.

J. P. BEEKMAN.

Kinderhook, December 28, 1836.

Extract from the Cultivator.

PRICE AND VALUE OF MARL AND GREEN SAND IN NEW JERSEY.

This region of country is well calculated to be one of the most productive in the state; it abounds in marl, both the green sand, and calcareous or shell marl; the former is dug in many places within two feet of the surface, and the latter generally about six feet; the first is sold at the pit for 81¼ cents a load of 20 bushels, and the last at 50 cents per load. The application to the soil of both kinds is about the same in quantity, ranging from 5 to 25 loads per acre. The greatest distance to which they have hauled from this neighborhood is about 12 miles. The general use of marl here is quite recent, and no doubt as it becomes better known, the use of it will be greatly extended; and the time will come when it will be as much an article of commerce as lime. This last spring I purchased a farm here of between 50 and 60 acres, entirely worn out; the soil of part of the farm is sand, and the rest gravel, no clay any where about it. The farm has once been productive, and I judge, therefore, that it can be made productive again. Up to this time I have spread marl (both kinds) over about one quarter of the farm, and if you think this communication worthy a place in the Cultivator, I will, from time to time, give you the result of my endeavors to improve my place.

Considering marl, lime, and plaster of Paris, or gypsum, as stimulants merely, due attention will be paid to clover and grass crops, and barn yard manure; the last being composed of all the refuse of the farm, applied in a crude or unrotted state.

* * * * *

E. H. VANUXEM.

Long Branch, N. J. Nov. 17, 1836.

From the Journal of Commerce.

DUTY ON SPIRITS.

During the last week 2,600 bushels of foreign rye were sold in one lot for distillation at 142 cents a bushel. Almost all the rye which has been imported in such great quantities during the last twelve months, has gone to the distillery. Most of our domestic supplies have gone the same way, and so has also a very large proportion of the Indian corn. Thus the bread stuffs which are imported to supply the deficiency of our own crops, are snatched away and transformed into aggravations of the distress which already exists. In this view of the case it seems to us very doubtful whether the duties on all foreign spirits might not better be repealed. They have been supposed, by enhancing the price of foreign spirits, to do something to check intemperance. But the difference from this cause is so very small as hardly to be perceived upon the small quantities which are retailed. Whether drunkenness be produced at the expense of four cents, or six cents, is a consideration which weighs very little with the drunkard. Distillation is not a species of manufacturing which we wish to cherish by protecting duties. It would require but half the ship-room to bring the whiskey, which is required to bring the rye, and possibly if the duty were repealed, and the whiskey were imported ready made, the portion of room left vacant in this way, might be filled with rye which would actually be made into bread. At any rate, we should be saved the mortification of seeing the staff of life which had been brought three thousand miles to support us, snatched away and distilled into the scythe of death.

A numerous and respectable meeting of Philadelphians have passed a resolution requesting the farmers and distillers of Pennsylvania not to purchase or sell, for distillation, or use for that purpose, any merchantable grain, for the ensuing three months. It is stated in Pitkin's Statistics, that in 1810, between five and six million bushels of grain were distilled in the United States, and it is supposed the amount is equally great at present. If distillers would put out their fires, there would be no scarcity of bread-stuffs, notwithstanding the short crops.—*Ib.*

From the Rail Road Journal.

POPPY SEED OIL.

Paris, Oneida County, New York, Oct. 1836.

Mr. D. K. Minor,

Dear Sir,—Being a subscriber to your valuable and interesting Journal, I am favored with the perusal of comments, (extracted from the Journal of the Franklin Institute,) on the production and manufacture of salad, or table oil, in the United States, to be procured from the seeds of poppy: requesting information relative to what is already considered a very interesting part of French husbandry, &c. being and having been, a participator in the interest of this very important inquiry, and being a practical manufacturer of various kinds of oils, I have made such investigations, as I will venture to pen down, in answer to the request set forth in the columns of the Journal of the Franklin Institute, and submit the same to you for publication, should it meet with such approbation as will entitle it to a place in the columns of your Journal. In December 1824, Mr. Daniel Markham, of Madison county, N. Y. obtained letters patent, from the government of the United States, for the discovery and art, of manufacturing oil from the seed of poppy, to be used for culinary, and many other important purposes. But ignorance and prejudice, being predominant in the minds of those who have been addressed on this subject, sickness and indigence on the part of the enterprising projector, have ever held in check, the advancement of this important object in this country, for which reasons, it is believed, the patentee has just claims for a renewal of his patent, for seven years after the original has run out, to effect which, I believe, he is about to take preliminary measures. Myself and others, have from repeated trials, ascertained that 100 bushels of poppy seed can be procured from one acre of good land, after allowing amply for waste, &c. Doctor L. Bishop, of Oneida county, has raised the present season, at the rate of 147 bushels per acre, with taking very little pains in cultivation. This may seem to be, (in the minds of many,) an absurd exaggeration, but it is no less strange than true, and one bushel of this seed, will yield from eight to twelve quarts of oil of the first order; possessing (when drawn cold and pure,) a transparency equal to the best spring water, and a flavor far more delicious than the olive; it is extremely limpid, and never chills with frost. The present price of this oil, in the city of New York, is 50 cents per pint, and is sought after by the portrait painters, being the finest and best oil for their business. When burnt in a lamp, it sends forth a brilliant flame, and emits but little smoke; its medicinal qualities are mild, harmless, though effective in many cases, as proved by practice—it seems to possess none of the narcotic quality of which the poppy is so abundantly supplied, but seems to be admirably calculated for the table, and I doubt not, but the time is near at hand, when the genteel portion of our community, may oil their palates from the production of their own soil, and no longer be under a compliment to France, Flanders, or any other foreign country, for a similar enjoyment. I think the most proper time is the fall of the year, for sowing the seed, and as late as the frost will permit—there has been by myself and others, various methods resorted to, for the cultivation of the poppy; but I venture to say, the best mode is very far in the shade; but I hope that some of our agriculturists will take the trouble to appropriate a small piece of land, and a few hours time by way of experiment on this new piece of husbandry, (however trivial it may appear at first,) I doubt not they will be highly pleased and amply rewarded for their pains.

Sir, I am with much esteem,
Very sincerely, your humble servant,
E. S. S.

HILLSIDE DITCHES AS A SAFEGUARD AGAINST WASHING RAINS.

To the Editor of the Farmers' Register.

Mecklenburg, October 17th, 1836.

I notice that "A Gleaner," in a late No. of the Register, has expressed surprise and regret, that the value of hillside ditches, was estimated less highly than formerly, by some on "Ward's Fork," who had formerly used them. There can no doubt of the complete efficacy of the system remain on the mind of any man who will take the trouble to examine some of the hilly plantations in this neighborhood, where the practice of it was originated by Mr. Skipwith, and pursued by him successfully for years, and where it has been practised by his neighbors also, with success. Like the practice of horizontal beds or ridges which proved so beneficial in the hands of Arator and others, who were generally careful to do their work accurately, if it is not accurately executed, it will carry off ten times the soil it saves. Mr. John Nelson, of Oak Hill, has a field in full view of my house, which would convince the stoutest sceptic of the efficacy of hill side ditching.

For the Farmers' Register.

COMMERCIAL REPORT.

The navigation of our rivers has been closed for nearly a month past, and our intercourse with the interior has been inconsiderable; so that commercial operations are in a great measure suspended, and there is little to report on the subject. The ice is now disappearing.

The variations in the prices of produce are unimportant. Cotton may be quoted 14 to 15 cents, total receipt in Virginia, since 1st October, about 15,000 bales—of which 11,000 were exported to Europe, and the stock now on the first and second hand, is about 1500 bales. The total receipts in the United States, compared with those of the same period last year. show an excess of 100,000 bales. Prices have declined in the large southern and western markets—but are still high—ranging from 13 to 17 cents.

The small supplies of tobacco, barely adequate to the demand for our manufacturers, caused prices to advance a little; but this is considered as momentary. New lugs sell at 3 to 4½—new leaf 5½ to 6½, not including any of the higher qualities. The state of all foreign markets is very unfavorable. Contracts are stated to have been made by the French government for Virginia tobacco, on terms equal to $7½, per 100 lbs. here. The Kentucky crop is estimated to be at least 75,000 hhds.

Foreign grain continues to arrive in considerable quantity. The wheat sells at $2 to $2 15—rye $1 35 to 1 50.

Flour is quoted in various neighboring markets, $10½ to 12. Supplies from the west are kept back by the closing of the rivers and canals.

Corn has advanced to about $4 50 per barrel, or 90 cents per bushel, and cannot be expected to recede.

The legislature of Virginia has not yet decided on granting charters for new banks, and great anxiety is felt by those interested in promoting the extension of our commerce, manufactures and public improvements, which depend on the increase of banking capital.

Jan. 24. X.

From the Oct. No. of *Annales de l'Agriculture Francaise.* Translated for the Farmers' Register.

PROFESSORSHIPS OF AGRICULEURE (IN FRANCE.)

The king has issued an *ordonnance*, upon the report of the Minister of Commerce, directing the establishment of a Royal Conservatory of Arts and Trades, and a system of public and gratuitous instruction for agriculture. The instruction will be in three courses: 1st, on Cultivation—2nd, Agricultural Construction, and Mechanics—and 3rd, Agricultural Chemistry.

Translated from the same.

ROOFS COVERED WITH PAPER.

To cover the roofs of farm buildings, especially of barns, use may be made of sheets of paper, of which the best is the paper made of wool, which is both strong and cheap. Each sheet is steeped in a boiling mixture of three-fourths of pitch and one fourth of mineral bitumen, melted together. The sheets are left to dry a day or two, when they undergo a new immersion and a second drying, and they may be immediately used. They are fastened on the roof like slates, upon laths—then covered a line and a half in thickness, by means of a brush, with a liquid composition of two-thirds tar, (*goudron*,) and one-third pitch. The whole surface is sprinkled over with sand, or with iron dust from the forge. This kind of covering is very economical, and requires but very light frame work for the roof.

HORTUS SICCUS.

In studying botany, it is of advantage to prepare a book of dried specimens of plants; such a book is termed *hortus siccus*, a dry garden.

Choose from a plant a specimen having a flower, bud, leaf, and if possible a seed. Lay it upon thick blotting paper, placing one or two sheets of the same over it; upon which, unless the specimen be very succulent and thick, lay another specimen, and then more paper. Care must be taken to lay each part of the specimen smooth and flat upon the paper; no part of the specimen should be under another part; cut off any portion that is inconvenient to retain; if any bud or flower be too thick, pare off some of the under side to make them lie properly. When they are arranged, put a heavy weight upon them—after a *few hours* carefully shift the position of each specimen to a dry part of the paper, and replace the weight; repeat this, changing the paper if necessary until the specimen is perfectly dry. Prepare a solution of gum with a little camphor in it, and secure each specimen to a page in a folio of cartridge or white-brown paper; then write under each the name of the plant, class, order, tree, shrub, herb, country, &c. In the case of any specimen being very full of sap, a hot iron may be passed two or three times over the covering of the paper—taking care not to burn it.—*Hor. Cabinet.*

ANIMAL OR PUTRESCENT MATTER IN SHELLS.

In the last No. (p. 573) was inserted an inquiry from a very intelligent correspondent, from New Jersey, which seemed indirectly to charge us with the expression of opinions inconsistent with each other. The communication having been necessarily placed in the last half sheet of the No., there was no space for the explanatory reply which will now be offered. The reader will please turn to the passage referred to, at page 573.

The authority for recent oyster shells containing but "a *very small* proportion" of gelatinous or animal matter, that could serve as alimentary manure, is in Professor W. B. Rogers' analysis of oyster shells, communicated for the Farmers' Register, and printed page 589, vol. I. Before being thus informed, we had thought the proportion of animal matter in oyster shells much more considerable—but never supposed it equal to the proportion in muscle shells. Shells formed of *laminæ*, or very thin layers, such as those of the river muscle, contain much larger proportions of animal matter. Still, this matter in an oyster shell may be exhibited to the eye, by dissolving a thin fragment in weak muriatic acid, as in the experiment referred to by our correspondent in regard to muscle shells.

But our condemnation of the opinion expressed by Sir John Sinclair of the equal value of pounded oyster shells and pounded bones, was not founded alone on the much greater quantity of animal or alimentary matter in the latter—but also on the solid matter of bones being the *phosphate* of lime, which is generally a far more valuable manure than the *carbonate*, which forms shells. The admission of equal virtue and similar effects, to substances so totally different, was as absurd in a scientific sense, as it is false practically. But though shells are very different from bones, still they are highly valuable as manure: and if they can be pounded at a moderate expense, we doubt not of that process being preferable to burning. We certainly did not mean to speak lightly of the value of shells, or to discourage their use, when denying to them the claim of similar and equal effects with those of pounded bones.

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PRICES CURRENT.--January 27, 1836.

PRICES OF STOCKS.	Par value.	Offered.	Asked.	Last sales.	Last dividend for 6 months.
BANK—Virginia—per share, - -	100			118	4½
Farmers', - - - -	100			115	4
RAIL ROAD—Petersburg and Roanoke,	100	110	113	113	5
Portsmouth and Roanoke,	50	40		40	Unfinished
Chesterfield, ($53 of capital refunded,) - -	100		no sales		
Richmond & Fredericksburg,	100		110		Unfinished
Greensville & Roanoke, (both new and old stock.)	100	108½	109½	108	do.
Raleigh and Gaston, -	100		98	95	do.
Richmond and Petersburg,	100		100	100	do.
MANUFACTURING COMPANIES.					
Petersburg Cotton Manufactory, - -	100		125	125	10
Merchants' Do. old stock, -	100	150	155		12
Do Do. new stock, -	100	130			Unfinished
Matoaca Do. - - - -	100		135		7½
Do Do new stock, -	100	112		115	
Ettricks Do. - - - -	100	115		115	
Fleet's Do. - - - -	100	102½	105		
INSURANCE COMPANIES.					
Petersburg, Fire and Marine, - -	100	110		106	

EXCHANGE on England, - - - - - 10 per cent.

COUNTRY PRODUCE.

Wheat, red, (none in market)	$1 50 to 2 10	Cotton, - - - - -	$0 13 to 0 17
white, do. do.	1 75 to 2 25	Tobacco, old, none in market.	
Flour, superfine (country,) new	10 50 to 11 00	Do new, for manufacturing.	5 50 to 6 50
City and family -	11 00 to 12 50	Do Do lugs.	3 00 to 4 50
Corn per bushel, - -	0 95	Bacon (hog round) Virginia, new,	0 14 to 0 15
		Pork, fresh, - - - -	9 00

TO CORRESPONDENTS AND READERS.

The following communications have been received too late for this No.—"*Remarks on the farming of Nelson and Amherst, &c.*"—"*On cotton seed oil*"—"*Experiments on cultivating corn and cotton*"—"*A join-beef paper.*"—Some other articles previously received, still wait for the arrival of engravings necessary to accompany them.

JOHN CARTER,

AT HIS GARDEN AND NURSERY,

IN the suburbs of Richmond, has for sale, and on low terms, good rooted vines, and slips, of Norton's Seedling Grape, Catawba, Herbemont's Madeira, &c. &c.

AN APPRENTICE WANTED.

A BOY of 13 or 14 years old, of good habits and respectable connexions, and sufficiently acquainted with spelling and reading for the purposes required, will be received as an apprentice to the printer's trade, at the Office of the Farmers' Register.

EDMUND RUFFIN.

February 1, 1837.

☞ The Postmaster at Church Hill, Halifax, Va. has lately written to give notice that the Farmers' Register for the present year, (Vol. 4,) sent to that Post Office, to John Betts, has not been taken out, and that no such person resides in that neighborhood. As the order for the subscription was probably designed for some other P. O. of the same name, or was otherwise mistaken, any person who can furnish the proper direction, will confer a favor by so doing.

CONDITIONS
OF THE FARMERS' REGISTER.

EDMUND RUFFIN, *Editor and Proprietor.*

1. The Farmers' Register is published in monthly numbers, of 64 large octavo pages each, and neatly covered, at $5 a year—payable in advance.

2. Or five *new* subscribers by sending their names and $20 at one time to the editor, will receive their copies for one year, for that sum, or at $4 for each. Purchasers of any 5 volumes (except Vol. 1.) at one time in like manner, shall have them for $20.

3. The risk of loss of payments for subscriptions, which have been properly committed to the mail, or to the hands of a postmaster, is assumed by the editor. *All mail payments must be made in notes or checks of par value in Virginia.*

4 For all copies not received by mail, at the proper post offices, duplicates will be furnished to those subscribers who have complied with their own obligations.

5. If a subscription is not directed to be discontinued before the first number of the next volume has been published, it will be taken as a continuance for another year. Subscriptions must commence with the beginning of some volume, and will not be taken for less than a year's publication.

6. The mutual obligations of the publisher and subscriber, for the year, are fully incurred as soon as the first number of the volume is issued: and after that time, no discontinuance of a subscription will be permitted. Nor will a subscription be discontinued for any earlier notice, while any thing thereon remains due, unless at the option of the editor.

Additional articles for the future Volumes.

7. Any five *old* subscribers, by paying (for any volume) $20 *directly to the editor at any one time before the issue of No. 2, of that volume,* (which will be on June 1st) *and without causing any charge for postage or agency,* shall be credited for their five copies for the year so paid for—thus reducing the price to $4 for each. This privilege of course ceases for each volume, as soon as its 2nd number is issued.

8. Any postmaster who distributes to subscribers at his office 10 or more copies of the Farmers' Register, and will collect and transmit free of postage the payments, as collected, of not fewer than 10 subscribers, shall be furnished with the Nos. of the current volume, or, at his choice, a bound copy of a previous volume. In such cases, the name and payment of every *new* subscriber obtained by the postmaster, will be counted in the allowance of compensation, as equal to two old ones. But, of course, the deduction from the regular price of $5 is in no case to be made to both subscriber and collector.

9. Postmasters, or other persons, may avail themselves of either of the different advantages offered above for obtaining subscribers and collecting payments. But it must be understood in all such cases, that the person so acting *is not the agent of the editor*, but merely of the subscriber for whom he is acting: nor will the editor bear the loss of any payments so made, unless of sums proved to have been properly committed to the mail.

Editor's Address— Edmund Ruffin, *Petersburg, Va.*

BACK NUMBERS OF THE FARMERS' REGISTER WANTED.
Still higher prices offered.

For the purpose of furnishing complete sets to new subscribers, I will pay $6 each for copies of Vol. I. Farmers' Register, if complete, (with title-page, index, and list of subscribers,) and not materially defaced. If without the index and list of subscribers, $5.50 will be paid for the 12 numbers.

For any of the first 9 numbers of Vol. I., 50 cents each, will be paid—or (if preferred by the person offering them,) given in exchange for the whole nine, a complete copy of Vol. II., together with a copy of the Essay on Calcareous Manures. A few copies of Nos. 4 and 6 of Vol. I, will be bought at $1 for each. Of Nos. 10, 11, and 12, of Vol. I., the impression was increased, and they can be furnished at subscription price, to any who may desire to have them.

Complete and clean copies of the title-page and index of Vol. I., will be bought at 50 cents.

For any number not exceeding 15 copies of each of Nos. 7, 8, and 11, of Vol. III., 50 cents each will be paid, or if preferred, two different odd Nos. of Vol II.

The Nos. will be paid for, if delivered at the book store of Campbell & Ruffin, Petersburg, Va., or to the undersigned. If sent by mail, the cost and risk of the transmission, must be borne by the person sending them.

EDMUND RUFFIN.

☞ The Editor of the Farmers' Register, has received several letters from different subscribers requesting to be supplied with seed of the "twin corn" recommended in Mr. Garnett's address—also, for a few seed of the "Cherokee pea"—and one to purchase the "expanding harrow" invented by Mr. Garnett. Though very willing to aid in the obtaining these or any such articles, both to serve friends and to aid the general interests of agriculture, the obstacles to safe transmission to and from the various points of supply and demand, for these articles, are almost insuperable. It is therefore requested of Mr. G. (or of any other person) to still farther serve the public in the several articles recommended, by placing some of each at certain houses for delivery, in Richmond, Norfolk, and Petersburg, and to make known the places, and the terms, on the next No. of the Farmers' Begister, or earlier in other prints. Though not engaged in any such business, the editor will distribute any of these articles, left in his care, without charge for his own trouble, either to the seller or purchaser. An extended and properly conducted agency of this kind, as a regular business, is much wantad in Virginia—and would be both profitable to the undertaker, and highly beneficial to the agricultural interest in general.

PATENT HORSE SHOES,

MADE of best refined iron, and every shoe warranted; any failing to render the most perfect satisfaction, will be received back, and the money paid for the same, refunded. A constant supply, for sale by

THOMAS JANVIER, Agent, *No. 87, Smith's Wharf, Baltimore.*

P. S.—Henry Burden, Troy, New-York, has obtained letters patent from the Government of France, granting him the exclusive privilege of Manufacturing Horse Shoes, by his newly invented Machine.

Dec. 28—3t

Landreth's Garden, Vegetable, and Flower Seeds,

Warranted fresh and genuine. An extensive assortment expected daily at the Book Store of

CAMPBELL & RUFFIN.

[illegible]
Rodney, Jefferson Miss.

THE

FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the improvement of the Practice,

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

VOL. IV. MARCH 1, 1837. No. 11.

it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." ***Swift.***

PETERSBURG, VA.
PUBLISHED BY THE PROPRIETOR,
1837.

SUBSCRIPTION PRICE, FIVE DOLLARS THE VOLUME.

[This publication consists of four sheets—postage for 100 miles or less, 6 cents—over 100 miles 10 cents.]

11 Nos. Har. Vol 5.

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FRENCH
SUGAR BEET SEED.

THE subscribers have for sale 200 lbs. of white and yellow French Sugar Beet Seed. This lot of seed was raised last season from French Seed of the finest quality, and can be recommended as fresh and pure. Also directions on the cultivation of Beet Sugar.

In store, an extensive assortment of Garden Seeds, European Field Seeds, a large collection of Flower Seeds, and will have early in the spring a superb collection of Double Dahlia Flower roots, consisting of about 200 varieties.

Feb. 1, 1837. 2t.

ROBERT SINCLAIR, Jr. & Co
Baltimore.

CHINESE MULBERRIES, &C.

The Subscribers have still on hand the following:

30,000 Morus Multicaulis, the wood of which is fully matured, there having been no premature frosts on Long Island this season. Also, 50,000 cuttings can be supplied.

20,000 ingrafted trees of the new Chinese Mulberry, with large thick leaves, remarkable for the quantity of nutritious matter; this species being sufficiently hardy for the most northern latitudes, and possessing all the advantages of the Morus Multicaulis. These are from 3 to 6 feet in height.

3,000 Hybrid Morus Multicaulis, with large leaves and close joints, and 5 to 6 feet in height.

35,000 Florence Mulberry, with entire leaves, in which point they differ from the common white Mulberry. These are imported direct from the best silk district of France, are 1½ to 2½ feet in height, and will be sold at very low rates.

60 lbs White Italian Mulberry Seed.

☞-Priced Catalogues of Trees, Green House Plants, Dahlias, Garden Seeds, &c. will be sent to every applicant.

WM. PRINCE & SONS.

Linnæan Garden and Nurseries, Flushing, N. Y., March 1st, 1837.—1t

THE FARMERS' REGISTER.

Vol. IV. MARCH 1, 1837. No. 11.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

Extract from *Miscellanea Curiosa*, published in 1707.

CLAYTON'S LETTERS FROM VIRGINIA IN 1688.

Addressed to the Royal Society.

(Continued from Farmers' Register, p. 584.)

Being honour'd with the thanks of the Society for my last, and receiving by my worthy friend, Dr. *Moulin*, their commands to proceed, I have added here my observations of the waters, and part of the earth and soil. I shall waive both complements and apologies, since I have greater respect and honor for the Society than I can possibly express, and have no reason to suspect their favour, whose candidness I so signally proved in my last.

Of the Water.

'Twixt the two capes, the southern, call'd the *Cape Henry*, the more northerly call'd *Cape Charles*, there runs up a great bay, call'd the bay of *Cheesepeak;* nine leagues over in some places, in most, seven, lying much west, nore and south, dividing *Virginia* into two unequal parts. On the east side of this bay, there lies a narrow neck of land, which makes the counties of *Northampton* and *Accomack*. On the west side of the bay, there branches forth four great rivers, *James River*, *York River*, *Rapahanack* and *Potomack*, that rise from a ridge of mountains, whereof more in the sequel. These rivers plentifully water all the other parts of *Virginia*, emptying themselves into the great bay. The mouth of *James River*, which is the most southerly of them, the mouth of *Potomack*, which is the most northerly, may be a hundred miles distance: but as I have been credibly inform'd, that the falls of *James River*, are not past thirty miles from *Potomack*, which is a vast large river, nine miles over, in many places. I have been told it was navigable nigh two hundred miles, much higher than any of the other rivers: whence I conclude in future times, it will be the most considerable for trade, when the country comes to be inhabited further up into the main land. The other rivers are much about three miles over, a piece. And *James River* is navigable, at least eighty miles. Within four or five miles of *James Town*, *James River* and *York River* are not past four or five miles asunder. Yea, sloops of considerable carriage may sail up the branches of the two rivers, till they come within a mile, the one of the other; for I take it to be no more from Col. *Bollard's* to Major *Troop's* landing, and I believe they may come much what as near again at Col. *Coles*,' and several places. *York* River, is distant from *Rapahanack*, in some places, not past ten or twelve miles; *Rapahanack* from *Potomack*, not past seven miles in one place, tho' it may be sixty in others. The heads of the branches of the rivers interfere and lock one within another, which I think is best expressed after the manner, that an *Indian* explained himself once to me, when I enquired how nigh the rivers of *Carolina*, *Virginia* and *Maryland*, arose out of the mountains, from those that ran westerly on the other side of the mountains, he clapt the fingers of one hand 'twixt those of the other, crying, they meet thus; the branches of different rivers rising not past a hundred paces distant one from another: so that no country in the world, can be more curiously watered. But this conveniency, that in future times may make her like the *Netherlands*, the richest place in all *America*, at the present, I look on as the greatest impediment to the advance of the country, as it is the greatest obstacle to trade and commerce. For the great number of rivers, and the thinness of the inhabitants, distract and disperse a trade. So that all ships in general, gather each their loading up and down an hundred miles distant; and the best of trade that can be driven, is only a sort of *Scotch* pedling; for they must carry all sort of truck that trade thither, having one commodity to pass off another. This, (*i. e.* the number of rivers,) is one of the chief reasons why they have no towns; for every one being more solicitous for a private interest and conveniency, than for a publick, they will either be for making forty towns at once, that is, two in every county, or none at all, which is the country's ruin. But to return: the tides in these rivers regularly ebb and flow about two foot perpendicular at *James Town*; there is there, as they call it, a tide and half tide, that is, it flows near two hours along by the shoar, after that, it is ebb in the channel, and again it ebbs near two hours by the shoar, after that, it is flood in the channel. This is great advantage to the boats passing up and down the river. I suppose this is caused by many creeks and branches of the rivers, which being considerable many, tho' only three or four miles long, yet as broad as the *Thames* at *London;* others ten miles long, some above twenty, that have little fresh water which they carry of their own, but their current primarily depending upon the flux and re-flux of the sea. So that after the tide is made in the channel, it flows by the shoar a considerable time afterwards, being that those creeks are still to fill, and therefore, as it were draws up a source upwards by the shoar; and likewise, when the tide returns in the channel, the creeks that would not so readily disburse their water, being still to empty themselves, they make an ebbing by the shoar a considerable time after that it is flood, as I say, in the channel. So far as the salt waters reach the country, is deemed less healthy. In the freshes, they more rarely are troubled with the seasonings, and those endemical distempers about *September* and *October*. This being very remarkable, I refer the reason to the more piercing genius of those most judicious members of the Society: and it might, perhaps, be worthy the disquisition of the most learned, to give an account of the various alterations and fatal effects that the air has on humane bodies, especially when impregnated with a marine salt; more peculiarly, when such an air becomes stagnant: this might, perhaps, make several beneficial discoveries, not only in relation to those distempers in *America*, but, perhaps, take in your *Kentish* agues, and many others remarkable enough in our own nation. I lately was making some observations of this nature, on a lady of a delicate constitution, who living in a clear air, and removing towards the sea-coast, was lamentably afflicted therewith, which both myself and others attributed to this cause, she having formerly upon her going to the same, been seized in the same manner. But to return. There is one thing more in reference to this very thing, very remarkable in *Virginia;* generally twice in the year, spring and fall, at certain spring-tides, the most of the cattle will set on gadding, and run, tho' it be twenty or thirty miles, to the river to drink the salt water, at which time there's scarce any stopping of them; which the people know so well, that if about those times their heards are stray'd from their plantations, without more solicitation, they go directly to the rivers to fetch them home again. As for the waters in the springs in general, they are, I think, somewhat more eager than those in *England*. In that, I have observed, they require some quantity more of malt to make strong beer, than our *English* waters, and will not bear soap. I have try'd several by infusing of galls, and found little difference in the colours, turning much what the colour of common sack in taverns. I tried two wells at Col. *Bird's*, by the falls of *James River*, several wells near *James Town*, some springs in the *Isle of Wight County*. There's a spring in the *Isle of Wight*, or *Nansamond County*, vents the greatest source of water I ever saw, excepting *Holy-well* in *Wales*, but I had not opportunity to make experiments thereof. I tried likewise some springs on the banks of *York River*, in *New Kent* and *Gloucester County*, but found them vary very little as to colour. I could not try any thing as to their specifick gravity, having neither aquapoise, nor those other glasses I had contrived peculiarly for making such experiments, they being all lost with my other things. I had glasses blown would hold about five ounces, others about ten ounces, with necks so small, that a drop would make a considerable variation; with these I could make much more critical and satisfactory observations as to the specifical gravity of liquors, having critical scales, than by any other way yet by me tried. I used this method to weigh urines, which practice I would recommend to the inquisitive and critical physicians. I had made many observations hereof: but all notes were likewise lost with my other things. Yet I have begun afresh; for there are more signal variations in the weights of urines, than one would at first imagin; and when the eye can discover little, but judge two urines to be alike, they may be found to differ very much as to weight. By weight, I find observations may be made of affections in the head, which rarely make any visible alterations in the urine. I have found two urines not much unlike, differ two and twenty grains in the quantity of about four or five ounces: but let them that make these essays, weigh all their urines when cold, lest they be thereby deceiv'd. But to return to the spring waters in *Virginia*. There's a spring at my Lady *Berkley's*, called *Green-Spring*, whereof I have been often told, so very cold, that 'tis dangerous drinking thereof in summer-time, it having proved of fatal consequence to several. I never tried any thing of what nature it is of.

There be many petrefying waters; and, indeed, I believe, few of the waters but participate of a petrefying quality, tho' there be few pebbles or paving stones to be found in all the country. But I have found many sticks with crusty congelations round them in the ruins of springs, and stones figured like honey-combs, with many little stars as it were shot in the holes. And nothing is more common than petrefy'd shells, unless you would determine that they are parts of natural rock shot in those figures, which, indeed, I rather think; but thereof hereafter. Mr. Secretary *Spencer*, has told me of some waters participating much of *alome* or *vitriol* towards *Potomack*. Up beyond the falls of *Rapahanack*, I have heard of poysonous waters. But these I only mention as a hint to further enquiry of some others, for I can say nothing of them myself.

Of the Earth and Soil.

When you make the capes of *Virginia*, you may observe it low land, so that at some distance the trees appear as if they grew in the water; and as you approach nigher, to emerge thence. For one hundred miles up into the country, there are few stones to be found, only in some places, rocks of iron oar appear, which made me expect to have found many waters turn purple with *galls*, but never met with any. Providence has supplied the common use of stones, by making the roads very good: so that they ride their horses without shooing them; which yet are more rarely beaten on their feet, than ours are in *England*, the country and clime being dry, their *hoofs* are much harder; for I observed, that take a horse out of the wet marshes, and swamps, as they there call them, and ride him immediately, and he'll quickly be tender-footed. In some places, for several miles together, the earth is so intermix'd *with oyster*-shells, that there may seem as many shells as earth; and how deep they lie thus intermingled, I think, is not yet known: for at broken *banks* they discover themselves to be continued many yards perpendicular. In several places these shells are much closer, and being *petrefied*, seem to make a vein of a rock. I have seen in several places, veins of these rocky shells, three or four yards thick, at the foot of a hill, whose precipice might be twenty yards perpendicular, whose deif, I suppose, shot under the hill. Pieces of these rocks broken off, lie there, which I suppose, may weigh twenty or thirty tuns a piece, and are as difficult to be broken as our free-stone. Of these rocks of oyster-shells that are not so much petrefied, they burn and make all their lime; whereof they have that store, that no generation *will consume*. Whether these were formerly oysters, which left by the subsiding seas, (as some suppose, that all that tract of land, now high *ground*, was once overflowed by the sea,) were since petrefied, or truly stones, *sui generis*, I leave to the honourable society to determin. But when I consider the constant and distinct shooting of several salts, nature's curiosity, in every thing, so far exceeding that of art, that the most ingenious, when referr'd thereto, seem only endued with an apish fondness, I cannot think any thing too difficult or wonderful for nature; and, indeed, I do not apprehend, why it may not be as feasible to suppose them to have been rocks, at first shot into those figures, *as to* conceive the sea to have amass'd such a vast number of oyster-shells one upon another, and afterwards subsiding, should leave them *covered* with such mountains of earth, under which they should petrefie: But not to launch forth too far into those disputes, since I must modestly remember to whom I write. Often, in the looser banks of shells and earth, are found perfect teeth petrefied, some whereof I have seen, could not be less than two or three inches long, and above an inch broad: tho' they were not maxilary teeth, the part that one might suppose grew out of the jaw, was polish'd, and black, almost as jett; the part which had been fasten'd in the jaw and gums, was brown, and not so shiningly polished, or smooth; if they were, as they seemed to be, really teeth, I suppose, they must have been of fishes. The back-bone of a whale, and as I remember, they told me of some of the ribs, were digg'd out of the side of a hill, several yards deep in the ground, about four miles distant from *James Town* and the river. Mr. *Banister*, a gentleman pretty curious in those things, shewed me likewise the joynt of a whale's back-bone, and several teeth, some whereof he said, were found in hills beyond the falls of *James River*, at least a hundred and fifty miles up into the country. The soil in general is sandy. I had designed, and I think it might be worth a critical remark, to observe, the difference of soils seem appropriated to the several sorts of tobacco; for there is not only the two distinct sorts of a sweet-scented, and Aranoko tobacco, but of each of these be several sorts much different, the seeds whereof are known by distinct names, they having given them the names of those gentlemen most famed for such sort of tobacco, as of *Prior* seed, &c. Nay, the same sort of seed in different earths, will produce tobacco much different, as to goodness. The richer the ground, the better it is for Aranoko tobacco, whose scent is not much minded, their only aim being to have it specious, large, and to procure it a bright kite's foot colour. Had not my microscopes, &c. tools to grind glasses, been cast away, with my other things, I had made some critical enquiries into their several natures; I would have examined what proportion of salts, all the sorts of earths had afforded, and how water impregnated with their salts, would have changed with infusing galls, how with the syrup of violets, and how they would have precipitated mercury, or the like, and so far forth as I had been able, examined them by the several tryals of fire. I conceive tobacco to be a plant abounding with nitro-sulphurious particles; for the planters try the goodness of their seed, by casting a little thereof into the fire, if it be good, it will sparkle after the manner of gun-powder: so will the stalks of tobacco-leaves, and, perhaps, has something analagous to the narcotick sulphur of *Venus*, which the chymists so industriously labour after. The world knows little of the efficacy of its oyl, which has wonderful effects in the curing of old inveterate sores, and scrophulous swellings, and some, otherwise applied and qualified. The goodness of tobacco, I look on, primarily consists in the volatility of its nitre: and hence the sandy grounds that are most impregnated therewith, and whose nitrous salt is most volatile, for such grounds are quickliest spent, yield tobaccoes that have the richest scent, and that shortly becomes a pleasant smoak; whereas, in tobacco that grows on stiff ground, the salts seem more fixed, and lock'd up in the oyl, so that whilst new, 'tis very heady and strong, and requires some time for its salts to free themselves, and become volatile; which it manifests, by its having an urinous smell. The same reason satisfies why tobacco that grows on low lands as far as the salts, tho' the plant be never overflowed with salt-water, yet the ground that feeds the plant, being impregnated with salt-water, that tobacco smoaks not pleasantly, and will scarcely keep fire, but do all that a man can, will oft go out, and gives much trouble in frequent lighting the pipe, 'till after it has been kept some considerable time: which may be assign'd to the fixeder saline particles of the marine salt in these plants, which require more time e'er they be render'd volatile. Here it might be worthy an enquiry into the nature of filtration of plants, since we may hence gather, particles of the marine salt are carried along with the *succus nutritius* of the plant; concerning which, if it were not too much to deviate from the matter in hand, I should offer some reflections of my own, which the learned society might perhaps improve: for I think, thence might be made many happy conjectures as to the virtues of plants. So where we see plants, or trees, of an open pore, growing low, we shall find their juice has subtile parts: so have all vines, whether the grape vine, or briony, or a smilax, or the like. If a gummous plant or tree, that grows low, and close pored, it abounds with acid spirits, as *lignum vitæ*, &c. if it grow tall, and be open pored, it abounds with a subtile volatile spirit, as your firrs, and the turpentine tree. But to insist no further herein, than as this may be applicable to the present discourse: for I have observed, that that which is called pine-wood land, though it be a sandy soil, even the sweet-scented tobacco that grows thereon, being large and porous, agreeable to Aranoko tobacco; it smoaks as coursly as Aranoko: wherefore, 'tis, that I believe the microscope might make notable discoveries towards the knowledge of good tobacco: for the closer the composition of the leaf, the better the tobacco; and, therefore, the planters and merchants brag of the substance of their tobacco; which word, did they always take it in a true sence, for the solidness, and not mistake it for the thickness, it would be more consonant to a true observation: for as I said of the pine-wood tobacco, some of it is thick and not solid, and differs from the best tobacco, as buff does from tann'd leather; so that if the tobacco be sound and not rotten, you may give a great guess at the goodness of tobacco, when you weigh the hogsheads, before you see them: for if an equal care be taken in the packing of them, the best tobacco will weigh the heaviest, and pack the closest. Now I said, that the sweet-scented tobacco most in vogue, which was most fam'd for its scent, was that that grew on sandy land; which is true, if you would smoak it whilst new, or whilst only two or three years old; but if you keep the stiff land tobacco, which is generally a tobacco of great substance, five or six years, it will much excel: for though the sandy land tobacco abound with a volatile nitre at first, yet the stiff land tobacco abounds with a greater quantity of nitre, only that it is lock'd up in its oyl at first, and requires more time to extricate itself, and become volatile; but the pine-wood land having little of the nitro-sulphurious particles, neither is, nor ever will make any thing of a rich smoak. Discoursing hereof some days since, to a gentleman of good observation, that has been versed with maulting, he assured me, to back this, my supposition or hypothesis, he had observed, that barley that grew on stiff ground, required more time considerably to mellow, and come to perfection, than that that grew on light land. Having proceeded thus far to speak of tobacco, I shall add one or two things more. The planters differ in their judgments about the time of planting, or pitching their crops: some are for pitching their crops very early, others late, without any distinction of the nature of the soils; and 'tis from the different effects that they find, in that, sometimes early, sometimes the late planting succeeds: but they have not the reason to judge of the cause, to consider the accidents of the year, and the difference of the soils. In sandy grounds they need not strive so much for early planting, the looseness of the earth, and the kind natur'd soil, yielding all that it can, easily and speedily, and sand retaining the heat, makes the plants grow faster. But in stiff soils, if the crops be not early pitch'd, so that during the season of rains it have got considerable roots, and shot them some depth, if early droughts come, it so binds the land, that the roots never spread or shoot deeper, or further than the hill that they are planted in: for they plant them as we do cabbages, raising hills to set every plant in, about the bigness of a common mole-hill: observing this on the plantation where I lived, that it was stiff ground, I advised them to plant their crops as early as possible; and in order thereunto, I tried several ways to further the plants; but not to trouble you with the several experiments that I made, in reference thereto: what I found most advantageous was, by taking an infusion of horse-dung, and putting thereon soot, and then my seeds; this I kept forty eight hours in an ordinary digestive heat. I had two beds left me to sow, in the midst of those the people sow'd, and the quantity of seed that they generally allotted to the same quantity of ground; when I sow'd, I mix'd ashes with the seed, having decanted the liquor, that the seed might sow the evenner. The effect was, that my plants came up much sooner, grew swifter, and I had five plants for one, more than any of the other beds bore; I left the country shortly after, and so no certainty of the final result. There be had various accidents and distempers, whereunto tobacco is liable, as the worm, the fly, firing to turn, as they call them, Frenchmen, and the like. I propos'd several ways to kill the worm and fly, as by sulphur and the like; but had no opportunity to experiment it: I shall set down that I had most hopes of which, perhaps, may give a hint to others to try and improve. Tobacco-seed is very small, and by consequence, so is the young plant at first, that if gleamy weather happen at that time, it breeds a small fly, which consumes the plume of the plant; now it being early in the year when they sow the seed, *viz.* about the fourteenth of January, they cover the ground, to secure, as well as they can, their tender plants, from the nipping frosts, that may happen in the nights; they cover them only with a few oak-leaves, or the like; for straw they find apt to harbour and breed this fly: I therefore would advise them to smoak straw with brimstone, once in two or three nights, and so they might cover them securely, with that which would preserve them infinitely beyond the covering with oak-boughs; indeed, I would advise them to keep peculiarly so much of their Indian corn-blades, which they gather for their fodder, for this very purpose, being as I conceive, much the best, there being no chaff to foul their beds, and prejudice them when they should weed them. What they call firing is this: when plants are of small substance, as when there has been a very wet and cold season, and very hot weather suddenly ensues, the leaves turn brown, and dry to dust: the cause I conceive to be hence: the plant being feeble, and having a small quantity of oyl, which makes the more solid part of the plant, the earth being suddenly heated by the sun's fiercer beams, the roots are rather scorch'd and dried up in the earth, than nourish'd; so that the plant consisting only of watery parts, is consumed, as it were, by fire: sometimes hopeful plants, when by a suddain gust some master veins are broken, if suddain heat ensues, they likewise fire: for being not come to maturity, and being deprived of the supports of life and vegetation, they likewise perish, are dried up, and fall to dust. *French-men*, they call those plants, whose leaves do not spread and grow large, but rather spire upwards, and grow tall; these plants they do not tend, being not worthy their labour. Were they so critical, I believe, they might have great guess what plants were most likely to turn *French-men*, by observing whether the roots of the plants run downwards, as those whose branches are aptest to spire upwards: for though I have not made positive proof thereof, I have something more than bare fancy for my conjecture. I have pull'd up some of these *French-men*, and compar'd them with the roots of some other plants, and found them much longer than others; and 'tis observeable, loose soils, and sandy ground, are more subject thereto than the stiff land. The country of itself is one entire wood, consisting of large timber trees of several sorts, free from thickets or under-wood, the small shrubs growing only on lands that have been clear'd, or in swamps; and thus it is for several hundreds of miles, even as far as has yet been discovered. But that shall be reserved 'till another opportunity.

Extracts from the Journal of the Franklin Institute.

LIST OF PATENTS ISSUED IN MARCH, 1836, FOR IMPROVEMENTS OF MACHINES, &C. TO BE USED IN AGRICULTURE, OR DOMESTIC ECONOMY.

With remarks, by the Editor of the Journal of the Franklin Institute.

For making *Vegetable Extracts;* Thomas Close and John C. Standford, Rye, West Chester county, New York, March 18.

"The process consists in forcing through the cut, bruised, or powdered, particles of vegetable substances, a volume of steam, water, or other liquid, under and by a pressure, varying in intensity, according to the nature of the substances to be acted upon."

This patent is not taken for any particular form of apparatus; but a description is given of one which is considered and claimed as new. The pressure is to be continued for a longer or shorter period, according to the nature of the substance to be acted upon, and it is said that "the coloring matter, tannin, and other soluble parts of the wood or vegetable substance will be immediately and perfectly extracted, and with the use of a much less quantity of water, and in much less time than would be required by the ordinary process of boiling, infusion, or steeping, leaching, &c."

The patentees claim to be "the original discoverers and inventors of the art of extracting the soluble parts of vegetable substances, by means of the heavy pressure of steam, water, or other fluids, exerted upon and through the materials to be acted upon, however the pressure may be effected. Also the combination of the chamber and perforated lid as described; the combination of the boiler, water pipe, and steam pipe, with said chamber, and its said apparatus for the purposes aforesaid."

The whole process is well described, and we are not aware of any theoretical, or practical, objection to it; but, on the contrary, it appears to us that for many purposes it may be used with great advantage.

For a *Portable Cooking Stove;* Charles Vale, Newark, Essex county, New Jersey, March 18.

This stove, it appears, is intended to cook by means of anthracite, or charcoal, as fuel: but we are unable, from the description and drawing, to form any clear idea of its construction and use. There are letters of reference used, and figures referred to, in the description, which are not to be found in the drawing; we therefore must dismiss the affair.

For a *Hemp Brake;* John Pursell, Perryville, Mercer county, Kentucky, March 18.

The brake is made in the ordinary form, the patented improvement consisting in working the vibrating swords by means of a treadle, in the downward stroke, and in raising them by means of springs.

For *Manufacturing Salt from Salt Water;* Richard K. Cralle, Lynchburg, Campbell county, Virginia, March 18.

A very full description of the apparatus employed is given in the specification, after which the patentee says, "What I claim as my own invention, not heretofore known or used, in the above described machine, is the application of the principle of evaporation *in vacuo*, to the manufacture of coarse and common salt. I claim to have invented the means of applying a known principle in physics, to the new and useful purpose of salt making. The machine may be varied in construction, and the principle applied in other modes; but I claim to be the original inventor of the means of applying the principle of evaporation *in vacuo* to the manufacture of coarse and common salt."

The apparatus, as shown in the drawings, is intended merely to exemplify the principle, and not to furnish a definite arrangement; the description of it is elaborate and clear, but we find nothing to designate in what "its construction is peculiar to the purpose;" and therefore cannot tell what is claimed; this ought to have been distinctly set forth, as, in our opinion, it would form the only foundation for a valid claim. It has been decided that the application of a known machine to a new purpose is not patentable. To apply the same mode to the evaporation of water from a solution of salt, which has been applied so extensively to its evaporation from a solution of sugar, cannot fairly be called an invention, however useful it may be. If geese had never been roasted, although turkies had been usually cooked in that way, a patent for roasting geese would hardly be sustainable.

For a *Metallic Mill;* Joseph C. Gentry, Dayton, Montgomery county, Ohio, March 18.

A cast-iron cylinder is to be banded, or otherwise covered, with cast-steel, then turned smooth, and picked with a pointed, steel tool. A concave of cast-iron, forming nearly a half circle, is to be adapted to the cylinder; and ribs, or bands, of cast-steel, projecting about one sixteenth of an inch from its surface, or to be inserted in dovetail grooves, extending the whole length of the concave; these also are to be filled on their surfaces. The concave must be sufficiently open at one edge for feeding, and the cylinder is to be held down by springs, to prevent injury from the introduction of hard substances.

"What I claim is the steel or other metallic ribs, and the manner of fixing them in the concave. And the cast-steel or other suitable metal, plated or banded on the cast cylinder. The manner of relieving the action of the cylinder by springs back of the boxes, on which the journals rest. The manner of picking the cylinder and ribs, presenting the sharp edges to each other, as described above."

Such a mill would be costly, easily put out of order, and difficult to repair. We are very apprehensive, also, that, when in the best order, it would not make very good flour. The claims embrace too many individual parts of the mill, some of which would not be able to stand alone.

For a *Mortising Machine;* George Page, Keene, Cheshire county, New Hampshire, March 18.

The general resemblance in principle between this and some mortising machines which have preceded it, is such as to leave little apparent room for a claim, and it does not occupy a large space, being to "the mode of attaching the slide to the upper lever and that lever to the machine; and also the lower box, and circular brace as described." We shall not take time to describe these particulars, but have no doubt that they are equally good with other modes of attaining the same end, and that the machine, if well made, will work well.

For a method of *Making Pitch;* Henry Ruggles, city of New York, March 19.

The refuse, or tar, such as is left in making gas in the New York gas works, is to be boiled down to the consistence of pitch, and then put into barrels.

"I claim the exclusive privilege of boiling down, either in an open or close vessel, kettle or still, the liquid such as is produced at the New York gas house, in the manufacture of gas, and known there by the name of refuse, until it becomes of the thickness, or consistency of pitch."

The distilling of the spirit from the refuse, or tar, of gas works, so as to reduce it to the consistency of pitch, is a common and well known process in London, and in other places where there are large gas works; the *exclusive* right, therefore, is not likely to be conceded.

For *Backs of Stoves and Fire Places;* William R. Prescott, Hallowell, Kennebec county, Maine, March 19.

A tube of suitable diameter, say nine inches, and two or three feet long, is to be built in the back of a fire place, or fixed, in any convenent way, in a stove; a tube, of about two inches diameter, is to lead from without the room, into this longer tube, to supply it with cold air, and warm air tubes are to lead from either end of it, into the room, to afford a supply of warm air.

The claim is "to bringing, in the manner described, the cold air from without the room to which the fire place is situated and supplying it to the stove, and of thus keeping up a circulation of cold air from without, and of warm air into the room. The application of the apparatus described for fire places, stoves, and fire frames, for the purpose of warming rooms, and its general construction."

Whilst there is nothing new in this principle, the form pointed out for carrying it into effect would be one of the least efficient; the "general construction" is so general, and so extensively employed, that it is a little remarkable it should be claimed as new.

For *Preserving Milk for use on Voyages, &c.;* John Lewis Granger, city of New York, March 19.

Fresh milk is to be put into bottles, and these are to be closed, in the manner of corking, with some porus substance, which will allow air to pass through it; the bottles are then to be put into a vessel of cold water, and the whole gradually heated to the boiling point, after which the porous stopper is to be coverd with wax.

The claim is "to the evolving of gas, and suffering it to escape from the milk, and immediately afterwards excluding the atmospheric air from commingling therewith, by the method substantially as described."

We apprehend that the theory above intimated, namely, that the gas contained in milk is the cause of its spontaneous decomposition, is not founded in fact; were this the case, an exhausted receiver would as effectually effect the object in view, as the boiling heat, and this process would not be substantially as described." There is a chemical change produced in milk by boiling, by which its liability to further reaction is very much diminished, and which would not be produced by the mere expulsion of gas. This theoretical point, we are aware, has nothing to do with the validity of the claim, although we have thought proper to give it a passing notice; we have also something to say about the novelty of the process. In the celebrated report published by the French Government in 1810, on Mr. Appert's mode of preserving all kinds of animal and vegetable substances, milk is mentioned as having been preserved by boiling and corking closely; it was concentrated in the boiling by allowing a portion of its watery particles to evaporate; the process was, we think, substantially the same with the above, the principle of which was perfectly well known.

For a *Cider Mill;* Christian Sheaffer, Lebanon, Lebanon county, Pennsylvania, March 19.

This cider mill is to grind the apples by means of revolving nuts or, toothed cylinders, of which there are three, mashing into each other. All the novelty appears to be in the manner of building the mill. We are told that "the machine consists of two pair of stairs, a frame, an apple mill made of three cog wheels; cage or receiver, a press beam, two main screws, one assistant screw; two weight boxes, &c. &c." After describing the two pair of stairs, and the other component parts of the machine, it is said, "I claim as my invention the whole of the machinery, excepting what I have named the cage or receiver; the bed or box belonging to the cage or receiver, and the manner of mixing the straw with the ground apples, or rather the *smashed* apples." This claim to the whole machinery, cannot be understood to mean the machinery as a whole, but as applying to its component parts individually; scarcely one individual of which could bear the burden thus put upon it, without being *smashed.*

For a *Cooking Stove Grate,* and its appendages; Orrin Wilson, Concord, Middlesex county, Massachusetts, March 23.

The grate to contain the coal, or wood, is made with bars, and, in general, like the ordinary grate of an open fire place; but it is so affixed to a cooking stove, with ovens, or other desired appendages, as that it may be raised vertically, so as to communicate its heat more directly to the cooking department, or lowered so as to form an open stove. Above the grate, a windlass crosses, near the front of the stove, and four chains attached to this windlass, and to the four corners of the grate, serve to raise and lower the latter, as may be desired.

The claim is to "the moveable grate, or pan, whether operated with chains and pulleys, rack and pinion, or other mechanical powers; the peculiar adaptation, arrangement, and combination of the several parts of the stove, fire frame, or fire place, to the said moveable grate, for the uses and purposes herein described and set forth."

For a *Stove,* denominated the Sibelline Stove; Wm. M. Carmichael, Hempstead, Queens county, New York, March 23.

A cylindrical stove, lined with fire clay, is made in the usual manner. The stove is to be surrounded by a second cylinder, leaving an air chamber between the two, with apertures below to admit cold, and others above to discharge warm, air. The whole stove is to stand upon a drum, or pedestal, of a diameter considerably larger than the stove itself, and is to be surmounted by another drum, or hollow dome, elevated a few inches above its top; a smoke pipe from the centre of the top of the stove, conducts the smoke into the drum. Four, or more, hollow columns, connect the two drums, surrounding, but detached from, the body of the stove; these columns form flues between the two drums, and from one of them a smoke pipe leads into a chimney, there being a damper in the column, above the smoke pipe. When this damper is open, the smoke and heated air pass directly through the upper part of the column, and into the exit pipe. When the damper is closed, the draught has then to pass down the three open columns into the lower drum, and up the fourth to the smoke pipe.

"The arrangement and adaptation of the several parts of the stove, producing the one before described," constitute the whole claim, which is about tantamount to not claiming any thing. The resemblance between this and the stove patented by Mr. Atwater, at p. 54, vol. xvii. is not very remote; and this latter, as is there described, we view as but a modification of Spoor's stove.

For a machine for *Working off the ends of Casks, and smoothing them;* Sumner King, Suffield, Hartford county, Connecticut, March 23.

A vertical, revolving shaft is to carry a grapple, or a kind of spring chuck, which is to receive and hold the cask that is to be worked off by a leveller, a stock howell, a croes, and a plane. The claim is to "the revolving grapple tub, that secures the cask."

For a *Washing Machine;* Ezekiel Y. Watson, Albany, New York, March 23.

An oblong box, furnished, in its bottom, with a curved row of rollers, upon which the clothes are to be rubbed by a frame of rollers passing over them, constitute the machine; and "the before described machine for washing clothes," forms the claim.

For a machine for *Mortising and Tenoning;* Erastus M. Shaw, Wilbraham, Hampden county, Massachusetts, March 23.

This machine differs in its general construction from most of the mortising machines which we have previously noticed, and by more labor than we can bestow upon it, we think that we might find out the manner of constructing it; but the drawing is very indifferently executed, and to decypher it is a task we shall not undertake. The claim is to "the arrangement and adaptation of the several parts of the machine, producing the one here described for mortising and tenoning timber; particularly the manner of operating the machine, in causing the carriage to move to the right and left, whilst the slide, with the cutter, moves horizontally backward and forward, at right angles to the carriage."

For a *Straw Cutter;* James Hyde, Darien, Genesee county, New York, March 23.

There not being any claim made to any part of this apparatus, we know not what the patentee considers as new about it, and therefore pass it by.

For a *Thrashing Machine;* Hugh and Israel W. Edgar, Wayne county, Ohio, March 23.

This is a cylinder and concave machine, set with spikes, much in the usual way; the patentees claim the form in which they construct the frame, and the manner in which they fasten the spikes by screw nuts, rendering the whole strong and durable.

For an improvement in *Bee Hives;* Sturgess M. Judd, Danbury, Fairfield county, Connecticut, March 30.

The hive said to be improved, is that patented by Levi H. Parish, on the 5th of August, 1834. The claim made "in the suspension of said boxes, and in their movement in grooves, by which the bees are prevented from escaping during the removal of the boxes, as combined in the manner specified; and also the knives for separating the combs between the boxes and the slats." The peculiarities of these parts we leave to be examined by those interested in them.

For a *Horse Mill for Grinding Grain and Scouring Seeds;* John Hairman, Jr., Brownsburg, Bucks county, Pennsylvania, March 30.

The grinding machine consists of two grooved, iron, cylinders, of different sizes, and running with different velocities: one of them having a narrow, fluted, iron concave to aid in the grinding. A horse power, by which the mill is to be driven, is also described, but there is not any representation of it in the drawing; both machines, however, are claimed; the claim being to "the combination and arrangement of the several parts of the horse power in connexion with the grinding machine, as set forth."

However good the inventions might be, the foregoing claims would invalidate them. The whole grinding machine is claimed, yet it possesses but little novelty; the horse power is claimed, yet there is no representation of it, as required by law. And what would of itself be fatal, two distinct machines are included in one patent.

For a *Tide Water Wheel;* Carey S. Mercer, Franklin, Baltimore county, Maryland, March 30.

A horizontal wheel is to be placed in a case, or drum, having flooms at opposite sides thereof, to direct the water upon the buckets, either on the ebb or flow of the tide; guide pieces, or wings, are fixed within the flooms to direct the water upon the buckets; and the claim made is to "the curved guider as described." The contrivance is not worth many words, and we could not talk it into utility.

For an improvement in the *Cotton Planter;* Michael Beam, Buffalo, Lincoln county, North Carolina, March 30.

This patent is obtained for an improvement on a machine patented by the same person, Feb. 13th, 1835. The present contrivance consists, in part, of a barrel shaped reservoir, in which the seeds to be planted are put, and which revolves, as the frame upon which it is supported is drawn forward; it has adjustable openings, for letting out the seed, an apparatus for opening the furrow, and a harrow for harrowing the seed in. The points intended to be claimed consist of the peculiarities of form, structure, and arrangement, which are not very clearly described, and could not be understood without drawings.

For an improved *Franklin, or Open Stove;* John H. B. Swansey, Lynn, Essex county, Massachusetts, March 30.

"The improvement made by me is the addition of two more flues, or drafts, besides the common ones in the Franklin stove. One of said additional flues is to be made a little above the middle of the fire back, and to extend horizontally the whole length of the back, and is to be provided with a common damper, to open and close it. The other additional flue is to be placed along the front plate of the stove."

The drawing does not exhibit the thing very clearly; it does not, however, so far as we can judge, appear to be an affair of much importance.

For *Compressing Hay, &c., and Elevating Heavy Bodies;* Adrastus R. Chamberlin, and Artemas Cleflin, Richmond, Lincoln county, Maine, March 30.

A pinion and wheel are to turn a shaft, round which a chain is to wind, which chain passes over a pulley at the end of a piston rod, that is to carry the follower for pressing. The other end of the chain is to be fastened to some fixed body. Instead of passing over the pulley, on a follower, the chain may be attached to a stump which it is desired to draw from the ground.

The claim is to "the application of the pulley as used by us, for a single or double press; and the application of our machine to the raising of stumps or other heavy burdens." There are so many better machines, for effecting the same purposes, that this will stand but little chance of going into operation; or if it has been used, we apprehend that it will soon cease to do so.

For an improvement in *Wind Mills;* Job Wilbur, Fall River, Bristol county, Massachusetts, March 30.

This is to be a horizontal wind mill, to contain the vanes, or wings, of which, a round building, thirty feet high, and twenty in diameter, is to be erected; the upper part of this building, is made to revolve on the lower, in order to change the situation of two windows, or openings, made for the admission and discharge of the wind. Six vanes, placed on a vertical shaft, in the centre of the building, are to receive the action of the wind; these vanes are to be angled to hold the wind the more effectually.

There is no claim made, a point, in the present case, of no great importance, the structure being very much like others which have been tried, and abandoned.

For a *Machine for Ploughing and Thinning Cotton;* Harvey W. Pitts, Wilsonville, Shelby county, Alabama, March 31.

The claim made is to "the machine as described," a claim which it will hardly bear, as parts of it are very similar to machines which have been used for like purposes; yet we believe there is sufficient novelty in the contrivance to enable it to sustain the character of a new machine. We shall not take time to describe it, as it would be no easy task to render it intelligible without a drawing.

For a *Corn Sheller;* Albert W. Gray, Middletown, Rutland county, Vermont, March 31.

This machine is to operate upon the ears by means of a revolving, flat wheel of wood, set with points, and standing vertically; the ears are to be held up against it by means of a spring conductor. The general arrangements are very similar to those in other revolving, disk shelling machines, and the particular points and combinations which are made the subject of a claim, appear to be unimportant, not, we apprehend, rendering it either better or worse than others previously in use, and now public property.

For *Reflecting Ovens;* Cicero Van Allen, Penn Van, Yates county, New York March 31.

In the claim appended to the specification of this reflecting oven, we are told about two new principles in it, yet we are at a loss to discover one; it is so much like some other tin kitchens, for baking and roasting before the fire, and our eye so little like that of the inventor, that we cannot see the new parts to which he believes that he directly points. The sides, back, and bottom appear to be rectangular, and the top to slope regularly back; there is a spit for fowls, hooks for birds, bars on which to place pans, a dripping pan to catch the gravy, and a peep hole through which to observe how matters go on, and these constitute the "single reflecting oven."

For a *Self Moving and Accumulative Engine;* John James Giraud, city of Baltimore, March 31.

How many self-moving and accumulative engines have the same parentage with that before us, we cannot recollect, and do not think it worth while to examine, in the patent office, the register of their births; as to their deaths, no register exists, they having all been still born; we know, however, that the family would have been a large one had they received and preserved the living principle. We can tell little about the affair before us, but its author informs us that "the fly wheels run on friction wheels, bearing on the main shaft, and constitute the generating, regulating and maintaining powers of the engine." The power thus generated, regulated, and maintained, is to be applied to "general navigation and other purposes." Happily for the community, however, neither general navigation or other purposes which demand motive power, will consent to wait the generating, regulating, or maintaining power of Mr. G.'s accumulative engine, as otherwise they would never be generated, regulated, or maintained.

For a *Churn;* Thomas Nicholson, New Market, Shenandoah county, Virginia, March 31.

A churn, with a tub in the ordinary form, has a dasher shaft, which is to revolve alternately in reversed directions; for this purpose there are two beveled pinions upon the shaft above the lid; and a beveled segment wheel is to engage first with one, and then with the other of these pinions; such a contrivance is bad in principle, as all machinists know; segment wheels being generally poor things, and as here applied, altogether worthless.

For *Pronged Hoes;* Benjamin F. Boyden, Boston, Massachusetts, March 31.

These hoes are to be of cast-iron, rendered malleable in the usual way. They are to have raised ribs along the prongs, &c. to strengthen them, and to be tinned over their whole surface. The claim is to "the application of cast-iron in the manufacture of agricultural pronged hoes, and covering the same with tin;" but where is the invention or discovery?

For an improved *Winnowing Machine;* Jonathan Bean, Montville, Waldo county, Maine, March 31.

We are told that "the advantages this machine claims above others now in use, consist in durability, portableness, and expedition in cleaning all kinds of grain;" but although the machine claims this, the patentee does not claim the machine; and although he has given a voluminous account of admeasurement, and many outlines of separate parts of it, its construction is very imperfectly represented, and its peculiarities, if any it have, are unnoticed; the patent, in fact, is a patent for nothing.

For a *Horse Power;* Richard Skinner, Williamson, Wayne county, New York, March 31.

A main wheel, turned by levers, or sweeps, is to turn upon a hub, and axletree, instead of being fastened to a shaft. Nothing more.

For a *Cooking Stove;* Benjamin H. Pearson, Warner, Merrimack county, New Hampshire, March 31.

This stove has an open fire place, in the form of a Franklin; to which is attached an oven, and other contrivances for cooking. The claim is to "heating the oven on five parts; its particular situation to give a draft under the oven, with an open fire-place; the damper; the turning a crank with two half oval wheels to raise or lower the grate in the fire place."

For a *Hydrant;* David Horn, city of Baltimore, March 31.

There is nothing in the principle, and but little in the arrangement, of this hydrant, different from others in common use. The pipe through which the water enters, under ground, has a socket in it that receives a vertical shaft, up which it is to flow to the point of delivery; the lower end of the shaft fits into, and turns in the socket, as a key in a cock, allowing the water to pass into it when in the proper direction, and when turned round a quarter of a circle, the water in the shaft runs into the ground through a waste hole in the socket.

From the Maine Farmer.

MAKE YOUR BULLS WORK.

There is a practice among our farmers of letting their bulls be idle. Their oxen and their horses work, but their bull, if any they keep, is a gentleman. He does nothing and of course gets fat and lazy. Now an animal of this kind in our state is not a very profitable one. We know from experience, that anxious as many are to improve their stock, they are *as anxious* to have it improved for little or nothing as they are that it should be improved at all. We are sorry to say that this is the case, but facts are stubborn things.

Now if a farmer would make as much profit from them as he ought, he must put him into the yoke and make him toil and tug as well as his oxen. They are rather bad characters to break and discipline, but when it is once done, they are excellent for labor. We know of one or two at this present time that are used to the yoke, and more powerful animals of their inches cannot be produced.

There is no danger of injuring them if they are properly fed and judiciously driven. When kept up in a stall or small yard; they are exceedingly apt to become lazy and sluggish, and ultimately good for nothing at all.

We have had them become so lazy, that they were totally useless for any purpose, and were under the necessity of driving them about every day for exercise in order to invigorate them and bring them to a proper state of health and activity. But the same animal when yoked every day, would never manifest any thing of the kind, but would always be "on hand" when his services were wanted.

This, therefore, is proof positive that work is a good regimen for them, and indeed the only way in which they should be used, provided they are kept in a thriving condition, as every one would desire to keep his teams in order to make them profitable. We hope that our friends will keep an eye to the improvement of their stock. It is true that stock has been depressed in the market for two years past, but whoever lives to see another year, will find it advancing in price, and good stock will be in demand. Look out then for the main chance; be active and generous, and suffer no opportunity for reasonable improvements to escape.

From the New England Farmer.

ENCOURAGEMENT OF BEET ROOT SUGAR.

An order has been introduced in the legislature, and adopted, authorizing the Committee on Agriculture [of Massachusetts] to inquire into the expediency of affording legislative aid to the culture of the beet root, and the manufacture of sugar from that article. A bill will undoubtedly be reported favorable to the measure.

From the Newburyport Herald.

PEAT FOR FUEL.

At this cold season, when wood is so high and a good comfortable fire is so necessary, he is a benefactor, who will point out a new source of *burnables*, (if we may make an awkward word.) Now the fact is, that nature has provided fuel enough for the wants of man: it becomes scarce by our inattention, our folly, or our pride. The fields and meadows around us are rich in stores more valuable than the silver of the mine. It is astonishing to us, that at this season, when wood is decaying and money is scarce, more use is not made of *turf* or *peat*, which makes a very warm and cheap fire. There are two reasons why this article has fallen into neglect; the one is, it is supposed to give a disagreeble odor while consuming; and the other is, a farmer dislikes to dig it, because it must be cured at a most busy season of the year. As to the first, there is all the difference in the world, between peat of different kinds. Select a good meadow, let it be dried, and there is no bad smell—it burns as freely as the best Liverpool coal. We recently stopped at the house of a gentleman in Topsfield, who uses it entirely, and nevver saw or felt a more agreeable fire. It is true, that bad peat is wretched stuff; but the best is about the best fuel that you can find. As to the other reason, it is true it must be dried at a bad time for the farmer. But why might not a man make the procurement of it, his principal business? We venture to say, there is no way in which capital and time would turn to so much account. A single acre of good meadow will yield some thousands of cords. Suppose two men in a season to cure and deliver a thousand cords, (which might easily be done,) it would (at least this season) have commanded $5000. This is no small sum for the profits of a single year. Here then is a source of public benefit and private wealth. It must be allowed that the maxim of most people is—"Far fetched and dear bought." But why not use the wealth that lies at our very doors? We are persuaded that nothing but a knowledge of the merit of this article, and a smile from that capricious lady, Fashion, is necessary to make the use of it very general. It is not so dusty nor so cumbrous as the anthracite coal, which we buy so dear and bring so far. Let us try it. Who will take our hint? At any rate, fashionable or not, well cured peat, now in the market, would command five dollars a cord from somebody.

From the New England Farmer.

AGRICULTURAL SURVEY OF THE COMMONWEALTH OF MASSACHUSETTS.

We have been informed, and are much pleased to learn, that a topographical survey of this state, with particular reference to its agriculture, under the sanction of the legislature, is in contemplation. Surveys of this kind have been accomplished in Great Britain and Ireland, and the results have been very useful and interesting. Almost every cultivator has some improvement, or peculiar mode of tillage, some new or improved seed, plant, fruit, breed of animals, mode of treating their diseases, some new and and superior implements for facilitating and adding efficacy to labor; something peculiar in his practice of the art of husbandry, which, if generally known, would be generally adopted, and prove beneficial to every individual of the great family of man. The knowledge derived from actual survey, sanctioned by ocular demonstration, and correctly reported, could have none of the disadvantages attributed to *book farming*. It would be the results of experience, communicated, for the most part, by men who practice what they communicate, and who cannot afford to practise incorrectly.

In carrying into effect a survey of the kind alluded to, much—almost everything would depend on the agricultural knowledge and judgment, as well as industry, of the person or persons to whom the surveys may be entrusted. It would be easy to accumulate masses of matter, as flat, stale and unprofitable as the figures in the calendar pages of an old almanac; but if the inquirer knows what has been in use, and is capable of judging of what might be found useful in rural economy, mines of information might be explored, more valuable than those of Golconda or Potosi.

In order to obtain valuable results to the researches, said to be in contemplation, a *system* should be pursued as regards objects of inquiry. In Great Britain, the following course, or something similar, was usually adopted:—

Survey of Middlesex.

Middlesex is part of the north side of a vale watered by the Thames, and contains 179,200 acres, exhibiting a great variety of agriculture.

1. *Geographical state and circumstances.*

Climate.—Healthy; warmer near London, from the fires kept there. Stationary winds from south west and north east. In spring, frost in the hollows, when none on the hills: thermometer has been as high as 83°, and as low as 6° below zero.

Soil.—By long continued manuring, the surface soil almost every where looks like loam.

Surface.—Gently waving; highest towards the north; Hampstead 400 feet above the level of the sea, &c.

Mineral Strata.—1. Cultivated surface. 2. Gravel of flints, &c. Water: Abundant and excellent. The Thames falls about 24 feet in ten miles. Mineral waters, at East Acton, Hampstead and Bagnigge wells. Fish caught in the Thames: sturgeon, salmon, tench, &c. Spring water found at various depths, from 5 to 300 feet; the latter the depth at Paddington.

2. *State of Property.*—Estates generally under the care of attorneys and badly managed. Tenures: much freehold, considerable extent of copyhold, some church, college and corporation land.

Then follows: 3. Buildings; 4. Mode of occupation; 5. Implements; 6. Enclosing; 7. Arable land; 8. Grass lands; 9. Gardens and orchards; 10. Woods and plantations; 11. Improvements; 12. Live stock; 13. Rural economy; 14. Political economy; 15. Obstacles to improvement; 16. Miscellaneous observations; 17. Means of improvement.

Other topics of inquiry might be added to, or substituted for some of the above mentioned; and, perhaps, circular letters containing queries relative to such points of information as are thought of the greatest consequence, might be sent to intelligent cultivators, in the towns about to be visited for the purposes of agricultural surveys, &c. By such and other means which will suggest themselves to practical and ingenious cultivators, a mass of information may be elicited which will be of a value, scarcely to be overrated by the most sanguine anticipations.

From the Saratoga Sentinel.

ELECTRO-MAGNETIC ENGINE.

In company with Dr. Steel and several other gentlemen, we called upon Messrs. Davenport and Cook, of this village, on Saturday, with a view of examining the electro-magnetic engine invented by the senior partner.

The ingenuity, yet simplicity of its construction, the rapidity of its motion, together with the grandeur of the thought that we are witnessing the operations of machinery propelled by that subtle and all pervading principle, electricity, combine to render it the most interesting exhibition we have ever witnessed.

Although we shall say something on the subject, it is perhaps impossible to describe this machine by words alone, so as to give more than a faint idea of it to the reader.

It consists of a stationary magnetic circle, formed of disconnected segments. These segments are permanently charged magnets, the repelling poles of which are placed contiguous to each other. Within the circle stands the motive wheel, having projecting galvanic magnets, which revolve as near the circle as they can be brought without actual contact. The galvanic magnets are charged by a battery, and when so charged, magnetic attraction and repulsion are both brought into requisition, in giving motion to the wheel—

the poles of the galvanic magnets being changed more than a thousand times per minute.

Having in its construction but one wheel, revolving with no friction except from its own shaft, and from the wires connecting it with the galvanic battery, the latter of which can scarcely be said to impede the motion in any degree, the durability of this engine must be almost without limit.

There is no danger to be apprehended from fire or explosions: and we understand it is the opinion of scientific gentlemen who have examined it, that the expense of running this machine will not amount to one fourth as much as that of a steam engine of the same power.

From the time when the Greek philosopher supposed the magnet possessed a soul, its mysterious power has been regarded with increasing interest and attention to the present day. In addition to its utility in the compass, thousands have labored in vain attempts to obtain through its agency a rotary motion. So intense has been the application of some to this subject, that in the attempt they have even lost that elevating attribute of our species, reason. It was reserved for Mr. Davenport to succeed where so many had failed.

He commenced his labors more than three years ago, and prosecuted them under the most discouraging and unfavorable circumstances—sustained by a constitutional perseverance and a clear conviction of ultimate success. He obtained his first rotary motion in July, 1834; since which time he has devoted his whole attention to improvements in his machine. During this period it has passed through five different modifications, and is now brought to such a state of simplicity and perfection (having apparently the fewest possible number of parts,) that the proprietors consider no further important alterations desirable, except in the due proportions of the different magnets, in which they are daily improving.

We were shown a model in which the motive wheel was 5½ inches diameter, which elevated a weight of *twelve pounds*. And to illustrate the facilities for increasing the power of this engine, another model was exhibited to us with a motive wheel of eleven inches in diameter, which elevated a weight of *eighty-eight pounds*. Although these models have been for some time in progress, and we have occasionally been permitted to examine them, we have waited till the present period, when the practicability of obtaining a rapid and unlimited increase of power seems to be placed beyond a doubt, before expressing an opinion, or calling the public attention to the subject.

If this engine answers the expectations of the inventor, (and we believe no one can assign a *reason* why it should not,) it is destined to produce the greatest revolution in the commercial and mechanical interests, which the world has ever witnessed. We may consider the period as commencing when machinery in general will be propelled by power concentrated upon the plan of this engine; when the vessels of all commercial nations will be guided to their point of destination and urged forward in their course by the same agent, triumphantly contending against winds and tides, with the silent sublimity of unseen, but irresistible power!

The prophetic ken of science is happily exhibited by Dr. Lardner, in his Treatise on the Steam Engine. His far seeing genius seems to have anticipated the invention of which we are speaking. "Philosophy," said he, "already directs her finger at sources of inexhaustible power in the phenomena of electricity and magnetism, and many causes combine to justify the expectation that we are on the eye of mechanical discoveries still greater than any which have yet appeared: and that the steam engine itself, with the gigantic powers conferred upon it by the immortal Watt, will dwindle into insignificance, in comparison with the hidden powers of nature still to be revealed; and that the day will come when that machine, which is now extending the blessings of civilization to the most remote skirts of the globe, will cease to have existence, except in the page of history."

From the ingenuity, perseverance, and mechanical skill of Ransom Cook, Esq. who has himself made an important invention in this engine, and has undertaken to bring the same into use, we anticipate a speedy introduction of its merits to the public. It is hoped that he may prove a second Livingston to another Fulton. He is about to depart for our large cities, in some of which he contemplates the erection of powers for mechanical purposes.

Several individuals, agents of Messrs. Davenport and Cook, are also departing with models to secure letters patent in the different countries in Europe and South America.

For the Farmers' Register.

REMARKS ON THE AGRICULTURE OF NELSON AND AMHERST.—NO. I.

Nelson, January, 1837.

Dear Sir:—All those who have received pleasure or instruction from the perusal of the Register, will feel the force of the application you make in your December number, for literary contributions. Being myself one of that number, (although, heretofore certainly not intending to write on the subject of agriculture,) I regard it now as proper to make an attempt at reciprocity for the labors of others. And, in truth, there never was a time when it was more incumbent on those who wish well to Virginia, to endeavor to show that the efforts of the agriculturist may be compensated here, and that there is no necessity to fly from sterility at home, to climates far more unfavorable to health and life, in order to procure the means of comfortable subsistence. If bills of mortality were accurately kept for the south-western states, it would be seen at what an enormous sacrifice of life those countries are settled, by persons who leave climates where health may be enjoyed, and where tolerable agricultural skill, with industry, would furnish in abundance the necessaries of life. That I know to be the case in the country lying on the eastern side of the Blue Ridge, from my own experience—and yet scarcely any other presents to the eye of the traveller, a more wasted appearance. The old fields exhibit numerous galls and gullies, whilst decayed fences show, in many cases, the ground is abandoned, because, in the language of the country, it is *worn out*. Yet a farm is occasionally seen in quite a different condition, where the land, not in tillage, is covered with good crops of clover and other grasses, and that under the plough, from the burthen it bears, promising an adequate return for the labor bestowed.

This difference, at the first glance, is seen to spring from a different system of management. Let us briefly contrast them. The old consisted, and, in many places, yet consists, in clearing land, however steep, and cultivating it in tobacco, planted in hills, made for the purpose in rows running directly up the ascent, leaving a space between them, in which the water of heavy rains collects in torrents, and bears off a portion of the soil to the plain below. Year after year, the land is cultivated in tobacco, until the crop fails so much as to threaten loss to the planter. Then the ground is put in corn—the crop worked by shovel ploughs, cutting a shallow furrow, in many instances, directly up hill, loosening the surface just enough to be carried off by the first heavy rain. Wheat follows corn, and corn wheat, until the land is nearly exhausted. Then perhaps a year of what is called *rest* is given, which consists in turning in the stock of the farm to eat up every vestige of vegetation that appears during the season. In advanced stages of decline, rye and oats are substituted for wheat, and when numerous galls and gullies are formed, and broomstraw covers the residue of the field, it is abandoned as worn out, and thrown into common. The new mode is, simply to adopt the convertible husbandry, to follow grain crops with grass, principally red clover, to allow the land to remain under grass two or more years, before it is again subjected to the plough, to avoid close grazing, and to apply the manures of the farm-pens, stables, &c. The increase of crop is so immediate, and so considerable, from this better husbandry, that to those who are not aware how many prejudices exist in agriculture, and how extremely difficult it is for cultivators of the earth to change any of their habits, an adherence to the old mode seems unaccountable—habits, perhaps, more pernicious in a hilly country like this, where washing rains are so frequent and destructive, than in any other. Men, apparently with as good natural endowments as the rest of their species, have settled on lands here in the forest state, have built good houses, and made other expensive improvements, and yet have pursued such a system of culture, as rapidly impoverished their fields, and inevitably doomed them to sterility, before, in the course of nature, their own lives might be expected to terminated. To move in old age to a distant land, and encounter the privations and difficulties of a settlement in the wilderness, among pestilential marshes, howling wild bests, and men nearly as savage, is an arduous task; to remain at home in circumstances daily becoming more straitened, as the wants of a growing family are increasing, is little less perplexing. Yet this has been the dilemma of so many Virginians, and continues to be so to such an extent, that an examination of the means by which it may be avoided, may be useful, if it should prove the instrument of rescuing even one individual from that situation. The first step would seem to be, the exposure of the prejudices so operative in producing this result, and particularly with regard to the tobacco crop, which will doubtless long continue to occupy a large portion of the labor of this country.

It is extensively believed that its culture is inconsistent with the improvement of the soil, from the large quantity of labor it requires. It is true, the culture of tobacco requires a large portion of the time and attention of the laborers of a farm where it constitutes an important ingredient of the crops raised; but under a better system than that in common use, time enough is left, not only to prevent the farm from retrograding, but to maintain it in a state of progressive improvement. Instances exist in this country where tobacco has been largely coultivated for more than twenty years, and yet the general fertility of the farm has been more than doubled in that time.

Tobacco is believed by many to be one of the most powerful of exhausters, not only directly, but indirectly, by exposing the land to wash more than any other crop. As a direct exhauster, I think it less potent than Indian corn, wheat, rye, or oats. It affords the best preparation for the wheat crop, known to me—decidedly better than a naked fallow. It is true it exposes the land to wash under the ordinary management, not only more than any other crop cultivated by us, but so much, as to render the preservation of the fertility of the soil exceedingly difficult. But a better system is within the reach of every planter, which, at least, does not diminish the quantity or quality of the plant, whilst it preserves the soil. This system, I will endeavor hereafter to describe.

Those prejudices, by producing apathy, prevent the search after improvement which is indispensable to success.

Many suppose the nature of the labor employed in the southern states, is incompatible with an improving system of agricultue. The writer is convinced, from his own experience, it is better than the hired labor of the greater portion the nonslaveholding states.

In bodily health and strength, the black is fully equal to the white man. And as to willingness, necessity alone produces labor from the operative classes of any color. The agriculturists of the *free states*, as they are called, must closely inspect the work of their hirelings, to obtain an adequate return for their wages—and a serious neglect in that respect, would be soon followed by ruin. Where population is dense, and the competition for employment active—where it is a favor to be employed, and a serious evil to be rejected, then the landholder acquires a control over his hired labor that renders it very efficient. But where the demand for labor exceeds the supply, and the discharged laborer is eagerly employed, immediately after his dismissal by others, the case is widely different. And this is, in truth, the situation of most of the northern, and all the northwestern states. Did the landholders of the south bestow as much personal attention to their farms, as those of the north, and northwest, the impropriety of many of their practices would be forced upon their attention, and the adoption of better habits with steady industry, would speedily show their results. But the control they possess over their labor, enables them to delegate it to overseers. Crops are made with considerable injury to the soil by those who neither know or care how to preserve it. Ruin does not come so soon from neglect of busines, as it would to the northern landholder: it, nevertheless, too often comes at last; and when the soil is destroyed, the master finds subsistence for himself and slaves reduced to a scanty pittance. Paradoxical as it may seem, it is in truth the superiority of our labor that contributes to the cadaverous aspect of our country:

it enables us to live with much worse management than would be used, were it of an inferior description. If we were compelled to pay our laborers high wages, in money, every year, and the crop cultivated by them would not yield the means, the first year would close the business. But we give only victuals and clothes. Our capital, the soil, wastes so imperceptibly, we are scarcely aware of it; and finally when nothing more is to be obtained from it, we lay the blame on every thing but our own neglect and ignorance.

(*To be continued.*)

ON THE PRAIRIE LANDS OF ALABAMA, AND THE CAUSE OF RUST IN COTTON, SO FREQUENT ON THOSE LANDS.

To the Editor of the Farmers' Register.

———— Jan. 25, 1837.

Dear Sir:—I received day before yesterday the earlier volumes of the Farmers' Register, ordered to complete my set, together with the sheet containing your essay on prairies, to which you have asked my attention.

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Your theory of the formation of prairies* is, I have no doubt, the true one, and will claim the assent of every intelligent man who knows any thing of that interesting region. I live in Lowndes county, Alabama, the heart of the prairies—and I have always been convinced that they were produced by some original difference in the soil, and not from burnings, as has been idly suggested. That difference in soil you have doubtless pointed out, and if I had time, I could support your theory by a great number of facts, coming within my own knowledge; and I could show that the exceptions appearing to disprove your positions, are the strongest confirmations. The subject is of great importance to my section of country, and its investigation will, I have no doubt, lead to the discovery of the cause, and to the prevention of the rust in cotton, the most serious drawback on the value of that kind of land. I think you are wrong as to its being for want of *sand*. It is excess of *both lime and vegetable matter*, forming a chemical combination, and when that excess is overcome either by clay or sand, I have no doubt a cure would be effected; by clay, however, sooner than by sand. I believe the same result would be obtained by an increase of vegetable matter, which would neutralize the excess of lime. Lime, however, without a considerable amount of vegetable matter, cannot form that chemical combination which, in my opinion, rusts cotton. Hence on the peaks of prairie hills, where the lime exists almost alone, in a white chalky state, and where the soil is so poor as to produce scarcely anything, the land, by a *slight* application of vegetable matter, quickly improves, but never gets that peculiar loose, black, friable, and rich state which rusts cotton. This is the kind described in analysis No. 20, of your Essay on Prairies, (p. 332, vol. iii. Farmers' Register,) and though from poverty it produces but little cotton, it never rusts.

I can, by merely riding over prairie land, tell where it will rust. The rusting soil is always rich, deep, porous, and dry for a considerable depth below the surface, say five inches. It can be ploughed by a wooden plough, and is exceedingly fine for corn. The cotton plant requires a firmer and more compact subsoil for its tap root to enter, than can be found in this loose rich soil which rusts cotton. Hence on pulling up the plant which is much rusted, it will be found to have either no tap root at all, and to be supported entirely by lateral roots, which being small are very numerous—or the tap root, if it exists at all, is of a diminished size.

In coming to the conclusion that rust is produced by the too loose and porous state of the soil, arising as I think, out of the *chemical combination* of lime (in some form or other) and vegetable matter, when *both* of these substances are in excess, as compared with the other constituents of the soil, I am governed by the following facts.

1st. Excess of lime *alone*, cannot produce that loose soil which makes rust, because the greatest excess of lime is found on the summit of our open prairie hills, which are white and poor, but not as loose and porous as the blacker and richer land further down the hills, where the open prairie joins the "slues," or timbered land; and while the white and poor land on and near the summit, though producing smaller cotton, *does not* rust, the black, rich, and looser land, on the side of the hill, having less lime, but more vegetable matter, will certainly rust. The first, or white prairie, is the variety described in No. 20 of your analyses. For the first year or two, it produces very little; but after four or five years' cultivation, from the vegetable matter of the stalks left on it, and from exposure to the sun, it grows darker, and produces better. It is precisely like, and I think, nothing more than, the usual subsoil of prairie land, in high places showing itself on the surface. The black, loose, rusting land, where the open prairie, joins the woodland, is described in many specimens of your analyses, but is best described in Nos. 11 and 12, as the outskirts of the open prairie where it joins the hammock, (p. 332 vol. iii.) It is said in the statement of the analyses, that Nos. 11 and 12 contain no *carbonate* of lime; but I am convinced that they contain a large quantity of *lime*, in some form—or possibly magnesia. Those who are acquainted with prairies, can detect lime by the eye, but cannot determine whether it is *carbonate* of lime, or lime in some *other state*. The reason why I suppose that Nos. 11 and 12 have a great quantity of *lime* in *some state*, though not, as appears by your experiments, in the form of *carbonate* of lime, is, that I have seen such lands as they are described to be, and know, from the eye, that they have a large quantity of what is considered, by us, as lime, and besides, they are described as loose and porous; and every *other* experiment you recite, proves that these qualities of looseness and porosity are, on rich soils, in the precise ratio of the quantity of lime in them. From my acquaintance with the several specimens analyzed, by their description, except on the poor soils, and on Nos. 11 and 12, I should say that the measure of lime in them is an exact exponent of their looseness or want of adhessiveness; wherefore I conclude, if Nos. 11 and 12 have no carbonate of lime, they have a great quantity of the sulphate of lime, or lime in some other state—or otherwise, it *may* be magnesia.

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* Published in vol. iii. Farmers' Register, pp. 321 to 336.

2d. Rust is not produced by excess of vegetable matter *alone*, because our wooded prairies generally, such as are described in Nos. 3, 4, 5, 6, 24, 27, 28, 32, 33, are as black and as rich, or richer, than any of our rusting open prairies, but are closer, firmer, and more adhesive, and hence never rust cotton. With a quantity of *vegetable matter* as great or greater than any of our prairie soils, these specimens have, without an exception, but a *comparatively small quantity of lime.* If they had a portion of *lime* sufficiently *great* to make, with the *vegetable matter* contained in them, a compound of *both lime and vegetable matter* which should *exceed* the other constituents of the soil, and particularly its clay, I have no doubt they would be as loose and porous as any prairie lands could be, and therefore would rust as much. As I said before, that excess of lime does not cause that *porous and finely granulated* state of the soil which rusts cotton, so these experiments warrant me in saying that no known quantity of *vegetable matter* will have that effect. Hence I am driven to the conclusion that large quantities *both of lime and vegetable matter are required* to form that *compound in excess* which destroys the adhesiveness of the soil, and consequently rusts cotton. I know of but one kind of wooded prairie which rusts cotton, and that, not as soon, or as much, as the open prairie. I allude to a black, rich, dry, porous and adhesive soil, resembling Nos. 11 and 12, and other specimens of rich, open prairie, but covered principally with a tree called *warwhoo.* I have no doubt this variety has, in addition to its rich supply of vegetable matter, more lime than most wooded prairie soils, and for that reason it is less adhesive. When this land has been cultivated a number of years, it becomes very loose and open, and cotton rusts in it to an injurious extent, but not as badly as in the open prairie. Post oak is an indication of much clay in prairie land, and hence when you find much post oak, you find a land stiff and adhesive, good for cotton, free from rust, but not as good for corn as looser and more friable land of the same fertility. No. 5 (p. 331 vol. iii.) is one of the best specimens of this kind of land, and though it has no *carbonate* of lime, I am sure it has *lime* in some other form, but the quantity is not large compared with the other ingredients, particularly vegetable matter and clay.

If, then, I am right in supposing that cotton never rusts from excess of lime singly, or from excess of vegetable matter singly, but does rust when both these ingredients are found *together* in excess, I come to the conclusion, that when lime and vegetable matter forms a union or chemical combination, which exceeds the other ingredients of the soil, and particularly the clay, the soil loses its adhesiveness, and assumes that loose and porous state which produces rust. Hence all prairie lands which rust, have a large portion of both lime and vegetable matter, and of course a diminished proportion of clay or sand; and as the surface washes away, until you reach the subsoil, the excess of lime and vegetable matter increases, and with it there is an increased liability to rust. When, however, the surface is entirely washed away, the subsoil, though with a greater excess of lime, having but little vegetable matter, produces very *small* cotton, but never *rusted* cotton. On the other hand, "hog-bed prairie," as it is called, No. 30, (p. 333, vol. iii.) though abounding in vegetable matter, having, evidently to the eye, but little lime, (eight per cent. by the analysis, and this is, I think, more than usual,) but a large quantity of clay, never was known to rust.

If my hypothesis is true, that the want of adhesiveness in the soil is the cause of rust, and that this is produced by the combined excess of vegetable matter and lime, the following remedies, for that disease in the soil, present themselves.

1st. Clay, to a *certainty*, would destroy this excess, and substitute in place of looseness and too great friability, that adhesiveness which the soil wants, to prevent rust.

2d. Sand would also destroy this excess, and might (though I speak doubtingly,) give more closeness and compactness to the soil, and thereby prevent rust. It is used for opposite purposes on all other soils; but the sandiest soil is not so loose, light, and porous as the rusting prairie soil. Nothing but a bed of new ashes can compare with it. Besides, the sandiest pine wood soils are not so porous and open as to rust cotton; but on the other hand, light sandy "isinglass" lands on the rivers, worn out, are subject to rust, though not to the extent of prairie lands. They are, however, lighter and looser than *other sandy* lands, either on account of the isinglass, [mica,] or the presence of a large portion of calcareous earth. These opposing facts cause me to speak doubtingly of the effect of sand, although I am informed that the best prairie lands, for cotton, in Texas and some parts of Mississippi, have a much greater proportion of sand in them, than is to be found in the prairies of Alabama. The best cotton lands with us, are stiff lands, where clay predominates.*

If these two processes, or either of them, would prevent the rust, it is obvious they would at the same time impoverish the land, by lessening the relative amount of vegetable matter in the soil;† and in any event would be attended with great expense, as clay is no where to be found in the prairies, except in combinations of from sixty to eighty per cent. with lime, and sand is very scarce. In boring for wells, to the depth of hundreds of feet, the quantity of lime mixed with the clay does not diminish.

The question then presents itself, whether it is practicable, by animal or vegetable manure, to lessen the excess, or to neutralize the lime, so as to prevent that chemical union or combination which I have supposed to exist only when *both* these ingredients are in very large quantities? In other words, can the addition of vegetable matter reduce this excessively calcareous soil to what you call a rich "neutral soil?" Your analyses favor this opinion. Among the best soils for cotton, described in those numbers, few of them have any carbonate of lime; and none of them a large portion. I have no doubt, however, that in those having no *carbonate* of lime, there is lime in some other form, but perhaps, to use your idea, "neutralized." Nos. 4, 5, 6, 8, 29, and 31, have no carbonate of lime, and I have no doubt, with the exception of No. 22, are the best cotton lands described. No. 3, is doubtless good, but has too much carbonate of lime. The same may be said of No. 17. No. 19, good, but has lime in excess; the same remark of No. 24. No. 27, though *slue* or wooded prairie, approaches, I should suppose, to the character of warwhoo land, before described, and would not always be proof against rust. No. 28, I imagine, is of the same character.

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* We have no doubt but that in such soils, containing very little silicious earth, and yet very light from great superabundance of calcareous earth, an application of sand would stiffen the soil.—Ed. Far. Reg.

† The addition of barren sand would not *impoverish*, but *enrich* (or manure) the soil—or at least serve to increase its productive power. Though the vegetable or putrescent matter in soil is all that feeds plants, and therefore alone gives, *directly*, fertility to soils, still when in excess, the superabundant part is injurious to the crop, and its abatement, or being balanced by a barren but necessary earth, would be indirectly giving more productive powers, or richness to the soil. —Ed. Far. Reg.

I may here remark, that land which is light and loose, comparatively, though not enough so to rust cotton, produces very large stalks, but never bolls as well, as closer and stiffer soils. Hence post oak lands, which are always stiff, from a redundancy of clay, is proverbial for not very large, but very heavy bolled cotton; and besides its exemption from rust, is less liable to other casualties, and is considered more "certain for a crop." This fact explains my qualification of praise as to No. 3, No. 17, No. 19, and No. 24, though probably none of these lands have enough lime in them to make them sufficiently loose and porous to rust cotton. I am convinced, however, that by having more lime than they ought to have, they are not so close and adhesive as to produce as well as Nos. 4, 5, 6, 8, 29, and 31.

I am so well acquainted with the soils described, that, from the description given, I can form a very good idea of what they are. In fact, I am acquainted with some of the lands from which the specimens have been taken.

Upon the effect of manure in preventing rust, experiments have as yet been so partial, that opinion is very much divided. In the first two years of cultivating open prairie, before the grass roots and other vegetable matter are rotted and destroyed, rust scarcely shows itself. The same land, when it becomes older, and before its fertility is impaired, judging by the corn crops, will rust badly. Many have thought from this, that by sowing small grain, and leaving long stubble, the rust would be prevented; but so far as I know, this has, strange as it may appear, increased the disease. Others have manured lightly with cotton seed, and some have bedded their corn and cotton stalks in the ridge upon which they planted cotton. The success that has followed these two courses, is differently estimated by different individuals; and many think, though I differ with them, that the labor is thrown away. The effect is, however, not decisive. I have understood that stable manure has, with one gentleman, completely cured the worst forms of the disease.

From these facts I should infer that if manure is to do any good, it must be in quantities large enough to lessen or neutralize the lime, and I think the best form in which it can be applied, will be in clover, sown and then turned under. The experiments with clover have been few; but in one instance, I have been informed, it was sown on prairie land in Lowndes county, that it grew very large, and that it continued a good crop through three seasons. Our climate has been considered too warm for this plant; but this experiment shows that soil has much more influence than climate, and, I think, promises a cure for the rust. At any rate, the experiment is worth repeating.*

I fear I have tried your patience, by this long and undigested scrawl, in support of a theory as as to the cause and prevention of rust in cotton. The man, however, who succeeds in finding a remedy for this disease, will confer on the prairie region of the south-west, a public benefit, equaled only by that conferred on the people of eastern Virginia, by your Essay and experiments on the use of calcareous manures. I have written much more than I intended when I sat down, and must ask your indulgence for the hasty and very imperfect manner in which I have presented those crude reflections, which have sprung up in my mind, since reading the "Essay on the formation of Prairies," which you were so kind as to send me. You are at liberty to publish any portion, if you think any of my facts or opinions are worthy of notice. If not, I shall feel no mortification, that reflections which have travelled only with my pen, should be withheld. In any event, I shall, when I reach home, bestow some attention on the subject, and give you the result of better digested opinions.

If you can send me one other of your Essays on Calcareous Manures, and as many of the sheets containing the theory of the formation of prairies as you can spare, I will be greatly obliged to you, and will remit you their price, by being informed of the same. I wish to put them in the hands of a few intelligent friends in Alabama, and in so doing, I hope to confer a benefit on the agriculture of that fine state. I may perhaps send you some further specimens of Lowndes county soil, for analysis, as there are some varieties, which if analyzed would throw additional light on the subject of this letter.

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MEANS OF GUARDING AGAINST THE RAVAGES OF BLACK WEEVIL.

To the Editor of the Farmers' Register.

Person Co. N. C. Feb. 1st, 1837.

Mr. Editor:—Having perused your Register from the commencement of your fourth volume up to the present time, and having never seen any remedy for or against the black weevil, which has proved so destructive to the wheat crops after they have been housed or garnered, in this section of country, and I suppose generally through the whole of the wheat growing countries, I would state for the benefit of those whom it may concern, that I have found out a sure remedy, so far as my experience has gone, (say for the last five or six years,) which is simply this: Take, I would say, one sack of Liverpool blown salt, and have it properly mixed with one thousand bushels of wheat; or a half bushel of salt will be a sufficient quantity for one hundred bushels, if well intermixed. Since I fell upon this plan, I have not seen a black weevil in my crop of wheat, or houses where it is stowed away, although kept until it was very old. Before using the salt among my wheat, it was very often cut to pieces and spoiled, by the weevil, so that it was neither fit for bread nor market. I think the rice dealers or planters would do well to try the remedy, as well as the wheat growers, &c. I do not consider that any person would ever find their wheat or rice the worse, or injured with so small a quantity of salt to such a large bulk of wheat or rice. In fact, it is not to be perceived in the wheat or flour, either as it respects flavor or taste. If you think the above of any service to the public, or worthy of a place in your Register, you are at liberty to publish it with my own proper name.

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* This report of the success of clover on calcareous lands in Alabama, is highly gratifying, and accords well with the views we have elsewhere expressed. But a few years ago, it was a universal belief that even the climate of lower Virginia was quite too hot for clover culture to succeed. Now, it is established that marl or lime will make our worst soils fit for clover, and generally, also for the further improvement of gypsum; and that where the soil is thus fitted for clover, the climate ceases to be found unfriendly. We doubt not that the cultivators of the prairie lands of the south and west, may gain (or save) the value of many millions of dollars, by the yet untried use of clover, and by otherwise treating properly their calcareous soils, as required by their peculiar properties.—ED.

JOHN P. WEBB.

For the Farmers' Register.

SUBSTITUTE FOR HOP YEAST.

Take of wheat bran one quart—water, three quarts—two or three sprigs of common horehound—boil down to one quart—strain, bottle and sweeten in the usual way, and you have a fine yeast.

As I put but little confidence in recipes not authenticated by the proper name of the giver, I send mine, with the assurance that delightful loaf bread, made with this yeast, was used in my family more than a month or two.

S. G. T. COULTER.

New Kent.

From the Gardener's Magazine.

PROPAGATING THE PEACH.

1st. We gather the stones in the fall, which we bury about an inch under ground, (high and early ground is preferred, as the pits will sprout earlier in the spring,) spreading them singly, but as closely as you can, in order that the frost may have its full effect upon them. The best time for putting them in the ground, is the last of October, but any time in October or November will do.

2d. *Preparing the ground for the young trees.*—Select a rich and middling dry piece of ground, which, if very rich, will do without manuring, but if not, manuring is indispensable. Short and old manure is the best, and if some rich dirt be mixed therewith, I think all the better. The manure should be spread along the furrows, which should be made with a plough, four feet apart. If any other manure be added after, I would recommend lime or ashes. The ground should be ploughed as well as harrowed well, in the first place.

3d. *Transplanting.*—This should be done as soon as the pits begin to sprout in the spring, by dropping them in the rows already prepared for them, about eight or nine inches apart, and covered about an inch or more deep. Some nurserymen let the young sprouts grow six or eight inches high before they transplant them, but the former way, I think, the best. The young trees should be planted and hoed as often as necessary, in order to keep them free from weeds and grass, say three or four times each, the last just before budding, and not afterwards that season.

4th. *Budding.*—Select from the healthiest trees the scions of the kinds you wish to propagate, cut off the leaves and keep them in water, at least, the butt ends, (those buds which have three leaves on, are the best.) They may be kept in this manner three or four days. Then take the scion in your left hand, holding the butt end downwards, enter your knife about half an inch below the bud, and cut upwards about a quarter of an inch above the bud, taking the wood with it, and then cut across the twig deep enough for the bud to come off; then with the point of your knife take out the wood from the bud; then make a transverse cut in the stock to be budded, about three or four inches above the ground, (first trimming off the leaves and limbs about six inches above the ground:) from the middle of this cut, make a slit about half an inch downwards, then, with the point of your knife, open the bark on each side of the slit, by the transverse cut; enter the lower end of the bud therein, bearing it down with your thumb and finger, till the top side of the bud comes just below the first transverse cut; then with bark or yarn, wind above and below the bud, in order to keep close to the wood. In twelve or fourteen days, the bandages may be removed. The time of budding may be from the 20th of August to the 20th of September, perhaps later sometimes. In the following spring, when the buds grow three or four inches long, the old stalk should be cut off about an inch above the bud. In the following fall or spring, you may set out your orchard, putting the trees about twenty feet apart. The ground should be rich and dry—not springy. Manuring is indispensable, unless the ground be very rich. Corn or potatoes may be planted among the trees, with benefit to them for three or four years.

BEET SUGAR.

Notice has been officially given in the New York papers, that an application will be made to the legislature, at the next session, for an act of incorporation for a company for the manufacture of sugar from the beet root, with a capital of $500,000.

From the Genesee Farmer.

COMPARATIVE WEIGHTS OF GREEN AND DRY GRASSES.

A great number of accurate experiments show that on an average—

100	lbs. green	red clover	makes	27	lbs.	of hay.
100	" "	herds grass	"	40	"	"
100	" "	fresh meadow	"	38	"	"
100	" "	salt grass	"	39	"	"
100	" "	rowen or 2d crop	"	19	"	"
100	" "	corn stalks	"	25	"	dry stalks.

From the British Quarterly Journal of Agriculture.

ON THE SPECIES AND VARIETIES OF DOMESTIC FOWLS.

The varieties in the sizes, forms, and colors, of our domestic fowls, are sufficiently striking to attract the notice of the most indifferent observer; while, to those who can find subjects of reflection in every production of nature, they may be made an ample source of interesting remark, as well as of amusing experiment. "If people," says M. Reaumur, "are affected with the kind of pleasure so transitory to the most enthusiastic florists, who procure it but for a few days by a world of care and toil continued through a whole year—if they are affected by the variety and fine combination of colors in their favorite flowers, the poultry-yard, when well managed, may be made to offer them endless pleasures of the same description."

The greater number of cocks, even those of the commonest breeds, when exposed to the play of the sun's rays, exhibit the brightest colors; and with the glossy brilliancy, beauty, and varied mixture, we are the more struck in proportion to our minute observation of them. The hens, on the other hand, if the breeds have been select, are often no less worthy of admiration. Some, for instance, have spots distributed with great regularity, and so brightly white as to look silvery; others are termed golden, because they are spotted or speckled with a fine golden orange color; while the more common colors are varied in a manner almost endless—and, upon the whole, domestic fowls offer a multitude of colors, the several shades of which would be found with difficulty, if they were sought for among the birds of the woods or the waters.

It is no less worthy of notice, with regard to colors, that, among the fowls in a poultry-yard, they not unfrequently change in a surprising manner from the time when the chicks cast their down, to the annual moult of the full-grown fowls. It is no doubt the regular process, at least after the second and following moults, for the colors to continue much the same. I have at present a hen of the Spanish breed, which has been of a uniform black for two successive moults, but has now her neck, wings, and tail-feathers, tipped with pure white. I have another which was all over of silver-grey color, but has now her head and neck coal-black, with a ring of fine white at the base of the neck, while the rest of the body is finely speckled with black and snow-white. It is remarkable also, that this change took place in a few weeks, without any obvious moult, so as to cause her to appear anywhere bare of feathers.

M. Reaumur tells us, that in one of his hens which his poultry-woman distinguished from the rest by a crooked claw, when her coat began to be taken notice of, had feathers of the ruddy color, mixed with brown, so common among dunghill fowls. A year after, this hen was observed to become almost black, with here and there some large white spots. After the second moulting, black was the predominent color on every part of the body; but, strange to tell, upon the succeeding moult, white was the predominant color, and only a few black patches about the size of a half-crown piece could be observed. Upon the succeeding moult, all the black spots disappeared, and the hen became uniformly of a pure white like that of a swan. As she was at this time old for a fowl, that is, not less than ten years, it might be thought that old age, which whitens the human hair, likewise whitens the feathers of certain birds; but, in that case, M. Reaumur says the transition from the ruddy to the white ought not to have been made, as it really was, through the black, and was of opinion, as the hen was still vigorous and healthy, that she might again change her color, if she lived, to brown or black.

A cock which was observed also by M. Reaumur more carefully than the hen just mentioned, afforded him some proofs that the white color of the feathers was not, at least in that instance, caused by age. The owner of the cock was struck the first time he moulted with the singular change in his color, and, for five successive moults, there was always a considerable change of color. In his first year, he had some of the ruddy brown, mixed with white, so common in dunghill cocks; in the second, he was all over ruddy brown, or rather red, without any white; in the third he became uniformly black; in the fourth uniformly white; and in the fifth, when he was presented by the Prior of Bury to M. Reaumur as a curiosity, he had white feathers mixed with a good deal of ruddy color and brown, bordering upon chestnut, his neck, back, wings and belly being ruddy, and even where there were white feathers, they were mingled with ruddy ones. During the vacation, M. Reaumur was two months without seeing him, but, in this period, he became so changed as not to be recognizable, his feathers having become all over of the finest white. The following year he had partly white feathers, but the greater portion was ruddy, or rather of a fair red. Here, then, was a re-transition from white to a light brown, indicating that the whiteness of his feathers was not owing to the number of his years.

Such is a very small specimen of the interesting observations which might be made in the poultry-yard by those who choose to direct their attention, to the changes continually occurring there. In order, however, to lay some foundation for similar inquiries, and what may be deemed of still greater importance by most of the readers of this journal, the comparative value, in an economical point of view, of different sorts of fowls, I shall here attempt a sketch of the several species and varieties, as described by naturalists and practical writers; and, with these views, it may be advisable to begin with the wild species, natives of the warm climates of the east, supposed to be the origin of the tame varieties. Of the wild there are only two species.

1. *Java Cock.*

CHAR. SPEC.—Gallus Bankiva, *Temminck*. *Male:* Comb toothed compressed; wattled under the mouth; tail somewhat sharpened at the top, and sub-horizontal; feathers of the neck elongated, rounded at the top; head and back fawn-colored; wing-coverts brown and black; belly and tail black. *Female* brownish-grey and golden yellow; comb and wattles less than in the male. Inhabits Java. Comb and wattles ruddy; feet ash-grey.

Description.—This bird is indigenous to the Island of Java, and is specifically distinguished by a red indented comb, red wattles, and cinereous legs and feet. The male has a thin indented or scalloped comb, a sort of beard depending from the under mandible, the tail a little elevated above the level of the rump, and the feathers somewhat imbricated. The feathers of the neck or hackles are long, pendant, and rounded at the tips, and of the finest golden red; the head and back are fawn-colored; the wing-coverts are dusky, brownish, and black; and the tail and belly are black.

The female is of a dusky ash-grey and yellowish color, and has her comb and the beard under the mandible much smaller than the cock, with no feathers on the neck besides the long hackles.

M. Leschenault brought specimens of these birds, male and female, from the Island of Java, and deposited them in the museum at Paris. According to M. Temminck, they inhabit the forests and the borders of woods, and are exceedingly wild and shy. On examining this species, it will be found to exhibit many points of resemblance with our own barn-door fowls of the middle size, the form and color being the same, the comb and wattles similar; while the hen so much resembles a common hen, that it is difficult to distinguish it, except by the less erect slant of the tail. The rise of the tail is much more apparent in the cock; but it may be observed, that in all the wild species known, the tail does not rise so high above the level of the rump, nor is it so abundantly provided with covering feathers as in some breeds. It may be that the superabundance of nourishment, and the assiduous care of man, have contributed to the greatest developement of all their organs. Various tame breeds, indeed, such as the tufted, the Hamburgh, the double-combed varieties, and others, shew that domestication produces infinite varieties.

The Java cock very much resembles, both in form and color, the tame Turkish and Bantam varieties of the barn-door fowl; but the tail differs in being nearly horizontal and vaulted in the Java species, while in others it is more raised, and forms two upright planes, meeting above and diverging below. The hackles, or feathers which fall from the neck over the top of the back, are, as in the tame barn-door varieties, long, with divided plumelets or beards, the feather widening a little, and being rounded. The plumage is decorated with exceedingly brilliant colors. The head, the neck, and all the long feathers of the back, which hang over the rump, are of a shining flame-colored orange; the top of the back, the small and middle coverts of the wings, are of a fine maroon-purple; the greater wing-coverts are black, tinged with iridescent green; the quill-feathers of the wings are ferruginous red on the outer, and black on the inner edges; the breast, belly, thighs, and tail are black, tinged with iridescent green; the comb, cheeks, throat, and wattles, are of a more or less vivid red; the legs and feet are grey, and furnished with strong spurs; the iris of the eye is yellow.

The female is smaller than the male, and her tail also is a little horizontal and vaulted; she has a small comb and very short wattles; the space round the eyes is naked, as well as the throat; and, on this space, are some small feathers, distant from each other, through which the red skin can be seen; the breast and belly are light-grey or fawn-colored; on each feather is a small clear ray along the side of the mid-rib or stem; the feathers of the base of the neck are long, with disunited beards or plumelets of a black color in the middle, and fringed with ochre-yellow: the back, the coverts, the wings, the rump, and the tail, are earthy-grey, marked with numerous black zig-zags; the large feathers of the wings are cinereous-grey.

The reason which M. Temminck gives for believing that the Java cock is the wild stock of our domestic breed, or from which it derives at least its main origin, are, the close resemblance of the females to many of our tame hens; the nature of the feathers, and the forms and distribution of the barbs, which are absolutely the same in many of our tame cocks; and because it is in this species alone that the females are furnished with a comb and small wattles, characters not to be found in any other known wild species.

Another wild species, the jungle cock, has been maintained by Count Buffon and others to be the origin of our domestic breeds; but it will be evident from the following description that this opinion is erroneous.

2. *Jungle Cock.*

CHAR. SPEC.—Gallus Sonneratii, *Temm.* *Male*: Comb toothed, compressed; throat wattled beneath; ears naked; tail compressed and ascending; feathers of the neck cartilaginous, spotted, with yellow cartilaginous tips; wing-coverts reddish-chestnut, with the top enlarged, cartilaginous, fulvous: breast somewhat red: body varied with grey, white, and red; tail-feathers shining violet. *Female* less in size, and without comb and wattles; head feathered; body variegated with dull brown and red. Phasianus Gallus, *Lath.* Ind. Ord. ii. 625. *Gmel.* Syst. Nat. i. 737, sp. 1. *Linn.* Faun. Suec. No. 19.—Le Coq Sauvage, *Sonnerat.* Voy. Ind. ii. 153, tab. 94, male; and 160, tab. 95, fem. *Buff.* par *Sonnini*, v. 206, pl. 37, fig. 1 & 2. *Bonat.* Tab. Encl. Orn. 180, pl. 86, fig. 5. Coq et Poule, *Sonnerat*, *Temm.* Pig. et Gallin. ii. 246, Tab. Anat. iii. fig. 1 & 2, a feather of the neck and one of the wing-coverts.—Wild Cock, *Lath.* Synop. iv. 698.—Inhabits India: Length 3 feet 4 inches; comb and wattles red; feet armed with great crooked spurs.

Description.—The jungle-cock measures three feet four inches in length, and inhabits the great forests of India, continues to reproduce there in the wild state, and is clearly distinct from the domestic varieties reared in the same countries by the Hindoos, these resembling, in all respects, the tame breed of fowls in all other quarters of the globe. M. Sonnerat, however, thought very differently, and prided himself much on his supposed discovery of this as the origin of our common fowls, rejecting the statements of Dampier and others as to the existence of wild fowls, probably the Java species, in Timor, and other islands of the Indian seas.

The present species is one-third less in size than our dunghill cock, and, from the level of the feet to the summit of the head, the comb not being included, it measures 14½ inches; the comb is indented; the wattles resemble those of our dunghill cock, but the naked parts of the throat and head are more considerable. The feathers of the head and neck are longest on the lower parts, and their form and structure are different from those of the same parts in other cocks, whether wild or tame. The midrib or stem of these feathers is gross, and considerably expanded, forming a white stripe along the whole feathers, as far as the tip, where it becomes broader, and gives rise to a sort of gristly plate, of a rounded form, whitish, thin, and very polished. This gristly substance is found still more obvious on the wings. The tip, indeed, of all the wing-feathers forms a broad gristly plate, whose substance is solid, and very thick to the touch, though as shining and polished as in the feathers of the neck. These gristly plates are of a deep red color, and form by their union a plate of a red maroon, which looks as if it were varnished.

The jungle-hen is smaller than the cock, has neither comb nor wattles, and the throat is covered with feathers, a very marked distinction from our domestic hens. The space around the eyes is naked, and of a reddish color. All the plumage of the under parts is similar to that of the cock, but by no means so bright. She has not the long feathers at the nape of the neck, nor the thin gristly plates at the tips of the feathers. The whole of the upper parts are more or less blackish-grey, with white rays occupying the middle of the feather, and following the direction of its mid-rib.

The jungle-cock, in a word, seems to be as different from any known variety of our tame fowls, as a hare is from a rabbit, or a goat from a sheep; and the fact, that the jungle-cock is not domesticated in its native country of India, while our dunghill fowls are common there, seems to be decisive against the opinions of M. Sonnerat and Count Buffon.

Of the domestic species there are the following:—

3. *Domestic Cock.*

Char. Spec.—Gallus Bankiva (A.) domesticus, *Temminck*. *Male:* comb toothed, compressed; throat wattled beneath; tail compressed, ascending: feathers of the neck long and narrow, variegated with fine colors. *Female:* comb and wattles less than in the male.—Gallus domesticus et gallina, *Brisson*, Orn. i. 166; *Idem*, 8vo. p. 45; *Raii*, Synop. 51, A.; *Will*. 109, tab. 26; *Schaef*. El. Orn. tab. 38; *Rom*. Orn. i. 56, tab. 9, and p. 59, tab. 7; Storia degli Uccelli, ii. tab. 207 and 208; *Frisch*. tab. 127—129. Phasianus gallus domesticus, *Lath*. Ind. Orn. ii. 626, B.; *Linn*. Syst. Nat. i. 270; *Gmel*. Syst. Nat. i. 737, sp. 1, B.; *Retz*. *Linn*. Faun. Seuc. 206; *Borowsk*. Nat. ii. 177, Alector; *Klein*, Aves, 111, A. 1; *Idem*, Ov. 31, tab, 13, fig. 1.—Coq commun à Crete ou Coq villageois, *Buffon*, ii. 116, tab. 2; *Idem*, Pl. Enlum. i.; *Idem* par *Sonnini*, v. 104, tab. 85 fig. 1; Bonat, Tab. Encycl. Orn. 181, pl. 87, fig. 1; *Gmel*. Trad. Franç. ii. 407, var. b.; *Temm*. Pig. et Gallin. ii. 92, and Tab. Anat. ii. figs. 2, 3, 4, and 5; *Idem*, Tab. Annat. iii. figs. 3 and 4, a feather of the neck and one of the wing-coverts. Domestic Cock, *Albin*. Birds, iii. tab. 32; *Brown*, Jam. 470; *Sloan*, Jam. ii. 301, Phil. Trans. xii, 923; *Lath*, Gen. Syn. iv. 700.—Das gemeine Kamm oder Haushuhn, *Bechstein*. Natur. Deutschl. iii. 1212, tab. 44. (*a.*) Das Huhn mit dem kleine Kamme; (*b.*) Das Kronenhuhn; (*c.*) Das silberfarbige Huhn; (*d.*) Das schieferblaue Huhn; (*e.*) Das chamoisfarbige Huhn; (*f.*) Das geschupfte oder hermelinartige Huhn; (*g.*) Die Wittwe; (*h.*) Das feuerfarbige und steinfarbige Huhn, *Bechst*.—Gallo commune, Storia degli Uccelli, ii. pl. 207, pl. 211 and 213. Horned individuals.

Description.—The domestic cock is characteristically distinguished by a thin indented or scalloped comb, with wattles on each side under the beak; by the tail rising in an arch above the level of the rump; by the feathers of the neck being long and line-like; and by the colors being finely variegated.

The female has the comb and wattles smaller than those of the cock, is smaller in size, and has the colors more dull and sombre.

The influence of domestication in our tame breeds of this species, having produced alterations in the entire forms of the body and of the comb and wattles, it is diffiult to indicate the races which owe their origin to the same stock or source; but those races most approaching the primitive species (*G. Bankiva*) have undergone the fewest changes from taming, and have produced by interalliance the breed of dunghill fowls, with comb and wattles—the breed of tufted fowls, with small comb and wattles, in which those juices proper to form these parts have been, it would appear, expended in the production of the tuft of feathers which ornament the head;—all those breeds of fowls whose legs and feet are more or less covered with feathers, the origin of which may be attributed to superabundance of nutriment that has in this instance produced feathers on the legs, as it has formed a tuft on the head in the tufted fowl; the race of Hamburgh cocks which have the head hooded, and the feathers stretched back over the ears.

Exclusive of the more marked breeds to be afterwards noticed in detail, Dr. Bechstein, as we have seen in the synonymes, has distinguished eight varieties of the common domestic fowl, namely, the fowl with a small comb; the crowned fowl; the silver-colored fowl; the slate-blue fowl; the chamois-colored fowl; the ermine-like fowl; the widow, which has white tear-like spots on a darker ground; and the fire and stone colored fowl. It is, however, difficult in many cases to identify the distinctions made by foreign writers, with the fowls bred in this country. I shall class the varieties therefore, as distinctly as I am able, and will be glad to be corrected where I may fall into mistake.

4. *Dunghill Cock.*

The sort usually called the dunghill breed is a mongrel arising from crosses of all kinds of varieties, and consequently not distinguishable by any peculiar mark, but partaking more or less of the form and qualities of the parent birds. The varieties in most esteem are of middle size, with dark colors, and white, not yellow legs. Light colored or white bodies are more tender of constitution, and are said by some not to be good layers, though this does not always hold. White chickens are the best to fatten for the table.

5. *Game Cock.*

The game cock is the variety termed the English cock by Count Buffon and the French writers. It is more slender, both in the body, the neck, the bill, and the legs, than the other sorts, and the colors, particularly in the male, are in most cases very bright and showy. Even of the game cock, however, there are many varieties, some of which are more celebrated than others, among amateurs and feeders. Amongst these Sketchly mentions the black-breasted red, which, when true bred, is of a clear vivid dark red, without any shade of black whatever from the back to the extremities; the upper convex side of the wings equally red and black, even those feathers surrounding the posteriors; the whole tail-feathers black as well as the top of the wings; the beak and legs also black. The female is of a dark partridge color, with bright red hackles above, black beneath, the breast of a clear brick-red, and the beak and feet black.

The flesh of the game breed is white, tender, and delicate, and on this account marketable; but the propensity to fight is so strong among the chickens, that they often injure or kill one another, and hence it is difficult to rear them in numbers. The eggs are but small in size, but, like the flesh, they are much esteemed for their superior delicacy.

6. *Dorking Cock.*

Char. Spec.—Gallus Bankiva (*E*) pentadactylus. *Temminck,—Male and female* with five toes on each foot. Gallus pentadactylus, *Brisson*, Orn. i. 169; *Idem*, 8vo. i. 46; *Frisch*, Tab. 127, and 128: *Rom.* Orn. 62—Le Coq et la Poule à cinq doigts, *Buffon*, Ois. ii, 124; *Sonnini*, v. 190; *Gmel* Trad. Franç. ii. 408; *Bonnat.* Tab. Enc. Orn. 182, c.—Dorking Cock, *Latham*, Synop. iv. 703; Das funfzehiger Huhn, *Bechst*, Nat. Deutsch. iii, 1295.—(*a*) Das sechzehige Huhn; (*b*) Die Spornhenne, *Bechst.*; this variety is crossed from others, and differs only in the number of its toes, *Temm.* Pig. et Gallin. iii. 659.

Description.—Nobody can doubt that the production of two hind toes instead of one is merely accidental, like that of two thumbs on each hand sometimes observed to run in particular families of the human race; but double hind claws are certainly not peculiar to the fowls bred about Dorking in Surry, for five-toed fowls are mentioned by Aristotle in Greece, by Pliny and Columella in Rome, and by Aldrovand in Italy, hundreds of years ago, the breed then as now being reputed good layers. Dr. Brechstein mentions a variety variety with six toes, and another in which the female is furnished with spurs. The writer of the article "Poultry" in *Rees's* Cyclopædia, seemingly on the best information, says it is quite a mistake to suppose that the Dorking breed of fowls have uniformly five toes; but they are of a larger size than the ordinary dunghill fowls, the body long and the eggs large. The flesh is rather yellow than white, and requires to be improved by castration. It is not improbable that this large breed is a cross between the Malay or Shackback and the game variety. The colors are as variable as those of the dunghill fowl, but about Dorking, white is most prevalent, and many esteem a white color to be no less essential to the genuine breed, than the supernumerary hind claw.

7. *Poland Cock.*

Char. Spec.—Gallus giganteus, *Temminck.* Male and female . . . . Coq Jago, *Marsd.* Voy. à Sumatra, Trad. Franç.; *Temm.* Pig. et Gallin. ii. 84, et Tab. Anat. 2 fig. 1. The foot of the natural size —Inhabits Java and Sumatra; is twice as large as the common cock; comb and wattles bright red.—(*A.*) Patavinus. Comb toothed, variegated with beautiful colors. Gallus Patavinus, *Brisson*, Orn. i. 170; *Idem*, 8vo, i. 46: *Aldrovand.* Av. ii. 310 and 311, Tab; *Rom.* Orn. Tab. 8 and 9, 63. Storia degli Uccelli. ii. pl. 200 and 211.—Le Coq de Caux ou de Padoue, et les Poules de Sansevarre; *Brisson*, Orn. ii. 125; *Gmel.* Trad. Franç. ii. 409; *Tem.* Pig. et Gallin. ii. 86.—Das Paduanische Huhn, *Bechst.* Nat. Deutschs. iii. 1293.—Paduan Cock, *Latham*, Synop. iv. 707. Size agrees with the *Gallo giganteo*, and twice the size of the common cock. *Temm.* ut supra, iii. 654.

Description.—The original of this fine breed is supposed by Temminck to be the wild species described by Marsden as a native of Java and Sumatra, and termed by him the Jago cock, though little more is known of the wild sort than that it is double the size of the Java cock, (*G. Bankiva,*) or of our dunghill variety. Marsden says he has seen in the east a cock of this species, tall enough to pick crumbs from a dining table. They are said to weigh from eight to ten pounds. The comb both of the cock and the hen are large, frequently double, of the form of a crown, with a tufted crest of feathers, often largest in the hen. The voice is stronger and harsher than that of other fowls; but the most singular peculiarity is, that they do not come into full feather till about half grown.

It is now about two hundred years ago, since the Italian naturalist, Aldrovand, says of the Paduan breed, that the cock is very handsome, being adorned with five colors, namely, black, white, green, red and yellow; that the whole body is black, but the neck is clothed with very white feathers, the wings and back being black, tinged with green, the tail of the same color, with the base of the feathers white; that the head is adorned with a tufted crest of a black color, but having the base of the feathers white; that the eyes are surrounded with a red spot; that the comb is small, and the beak and feet are yellow.

The hen is all over black, tinged with green, except the small pellicle near the ears, which is white. They produce very large eggs.

8. *Crested Cock.*

Char. Spec.—Gallus Bankiva (B.) cristatus, *Temminck.* Crested on the top of the head with thick feathers, variegated with fair colors. Gallus cristatus et Gallina cristata, *Brisson*, Orn. i. 169; *Raii*, Synop. 51. A. i; *Aldorv.* Av. ii. 307, var. albo.—Phasianus cristatus, *Lath*, Ind. Orn, ii. 626, var. γ; *Linn.* Syst. Nat. i. 270, B; *Gmel.* Syst. Nat. i. 738; *Retz*, Faun. Suec. 206, No. 182; *Borowsk*, Nat. ii. 178, a; *Rom.* Orn. i. 60. Le Coq huppé et de Hambourg, *Buffon*, Ois. ii. 116; *Idem*, Pl. Enlum. 49; *Sonnini*, v. 179, Tab. 36; *Bonat.* Tab. Enc. Orn. 182; *Gmel.* Trad. Franc. ii. 408, var. a; *Temm.* Pig. et Gallin. ii. 239.—Crested Cock. *Lath.* Synops. iv. 703.—Das hanben Huhn, *Bechst.* Nat. Deut. iii. 1283.—(*a*) Das Huhn weissee mit schwartzes Federbusch; (*b.*) Das schwartze Huhn mit weissem Federbusch; (*c*) Das weisse Huhn mit dem grossem Barte, *Bechst*; agrees with other kinds except in the feathered crest. *Temm.* ut supra, iii. 556.

Description.—This variety is distinguished by a densely tufted crest, while the comb is small, and by being variegated with fine colors, while in all other respects it agrees with the common dunghill breed. Dr. Bechstein mentions, as we have seen in the synonymes, the following varieties, namely, white with a black crest; black with a white crest; and the white fowl with a large beard.

The breed of crested fowls is much esteemed by the curious, and is bred with great care. Those who are desirous of propagating any singular varieties, separate and confine the individuals, and do not suffer them to mingle with such as have the colors different. Those varieties are more esteemed in proportion as the colors are more rare, or as the tuft of the crest contrasts with the rest of the plumage; but, though the differences of plumage may thus be preserved pretty constant, they seem to owe their origin to the same breed, and cannot be reproduced pure without careful superintendence. These cocks are much esteemed in Egypt, in consequence of the excellence of their flesh, and are so common that they are sold for the value of twopence or three halfpence each. They are equally abundant at the Cape of Good Hope, where their legs also are feathered. Some travellers assert that the Mexican poultry are crested, but these, as well as all the rest on the continent of America, have been introduced from the old world.

There can be little doubt that all the varieties of crested fowls have originated from the intercrossing of uncrested breeds with the Poland and or Paduan.

9. *Hamburgh Cock.*

Das Hamburgischehuhn, *Bechstein.*

This is a variety of the preceding, distinguished by the thighs and belly being of a velvety-black color. The deportment of this breed is grave and stately; its iris is yellow; and its eyes are encircled with a ring of brown feathers, from which arises a black tuft that covers the ears. There are other feathers nearly like those behind the comb and beneath the wattles, and broad round black spots on the breast. The legs and feet are of a lead color, excepting the sole of the foot which is yellowish.

10. *Spanish Cock.*

This is a large breed, in which the prevailing color is black, with irridescent green, while the combs and wattles even of the females are more than usually large, the top of the comb for the most part flapping over on one side. The caps of the ears are large, and of a bluish-white color. It is evidently of a variety of the Poland, in which the nourishment expended in that to form a crest of feathers, goes to enlarge the combs and wattles. The Spanish hens lay very large eggs, and, like the Poland, is esteemed for fine flesh.

11. *Malay or Chittagong Cock.*

This is similar in size to the Spanish, differing in the color, not being so uniformly black, but brown streaked with yellow. The hens are said to be good layers, and the eggs are large, but their flesh is coarse in the fibre, and of a dark color. Hybrids between the dunghill breed and the common pheasant are sometimes also termed Malays.

12. *Bantam Cock.*

CHAR. SPEC.—Gallus Bankiva (G.) pusillus, *Temminck.* Male and female variegated with elegant colors; comb toothed, compressed. In all respects agrees with the common Bankiva Cock.—Gallus Branticus, *Brisson*, Orn. i. 172, var. b. *Idem*, 8vo, i. 47.—Gallus plumipes, *Rom.* Orn. 61; *Brisson*, Orn. i. 172, var. a; *Idem.* 8vo, i. 47. Gallus et Gallina minor, *Frisch*, Tab. 136 and 137.—Phasianus Gallus pusillus et plumipes, *Lath.* Ind. Orn. ii. 627; *Gmel.* 738.—Le Coq de Bantam, *Buffon*, Ois. ii. 119; *Sonnini*, v. 185; *Temm.* Pig. et Gallin; *Bonat.* Tab. Encycl. Orn. 182; *Gmel.* Trad. Franç. ii. 409; *Frisch*, Vög. Tab. 129.—Les Poules de Camboge et de l'Isthme de Darien, *Buffon* par *Sonnini*, v. 184, and 185. Bantam and Rough-footed Cock, *Lath.* Synops, iv. 706 and 707.—*Albin.* Birds, iii. tab. 33 and 34.—*Hayes*, Brit. Birds, tab. 23. Das Bantamhuhn, *Bechst.* Nat. Deut. iii. 1289, var. e. Some with the feet feathered to the toes, others with the toes feathered, others with the feathers elongated behind. *Temm.* ut supra, iii. 658.

Description.—This is a small variety with short legs, most frequently feathered to the toes, so as sometimes to obstruct the fowls in walking, but booted legs are not exclusively peculiar to bantams; so far from this, that bantam fanciers, with Sir John Sebright at their head, prefer those which have clean, bright legs, without any vestige of feathers.

The full bred cock should have a rose comb, a well feathered tail, full hackles, a proud lively carriage, and ought not to weigh more than one pound. The nankeen-colored and the black are the greatest favorites. If of the latter color, the bird should have no feathers of any other sort in his plumage. The nankeen bird should have his feathers edged with black, his wings barred with purple, his tail-feathers black, his hackles slightly studded with purple, and his breast black, with white edges to the feathers. The hens should be small, clean legged, and match in plumage with the cock.

About two hundred years ago, Aldrovand described the bantam cock to have the neck and back of a chestnut color, the wings at first black with whitish spots, afterwards black, the quill-feathers being white on the outer, and black on the inner sides; the throat, breast, belly, thighs, and legs, black with whitish spots; the feet yellow; the comb double and not very large; the beak yellow; the wattles large; the tail-feathers partly white and partly black.

The female bantam is described by Aldrovand to be of a yellowish color, and everywhere except the neck marked with oblong black spots; the wattles and comb are small; the beak and feet are yellow.

13. *Turkish Cock.*

SYNONYM.—Gallus Turcicus. *Brisson*, Orn. i. 170, var. d; *Idem*, 8vo, i. 46. *Aldrovand.* Av. ii. tab. p. 314–16. *Willugh.* 110. *Borowsk.* Nat. ii. 180. Phasianus Turcicus, *Lath.* Ind. Orn. ii. 627 *Gmel.* 738. Le Coq de Turquie, *Bonat.* Tab. Encyc. Orn. 182. Das Turkischehuhn, *Bechst.* Nat. Deut. iii. 1829, var. b. Turkish Cock, *Lath.* Syn. iv. 707.

Description.—This is generally considered to be a variety of the Bantam cock by M. Temminck and other writers, distinguished chiefly by the beauty and variety of its colors.

The Italian naturalist, Aldrovand, describes the Turkish cock as having the whole body whitish, except the wing-feathers and belly, which are black; the tail black, tinged with iridescent green, and some of the feathers green on the one side, and black on the other; the body is streaked partly with golden and partly with silvery streaks, which add wonderfully to its beauty; the legs and feet are bluish.

The Turkish hen is described by Aldrovand to be white, spotted here and there with black; the feet somewhat blue; the wattles are smaller than those of the cock; she is in every other respect like the cock, except that her neck is yellowish, and her tail all of one color.

Aldrovand also describes another variety of the Turkish cock, with feet entirely blue; the body spotted with white and black; the neck ashy-yellow; and behind the comb there is a crest of white feathers.

14. *Dwarf Cock.*

Char. Spec.—Gallus Bankiva (*D*) Pumilio, *Temm.* Male and female with very short legs; size of a pigeon. Gallus Pumilio, *Brisson*, Orn. i. 171, sp. 2; *Idem*, 8vo, i. 46; *Raii*. Synops. 51, a, var. 2; *Frisch*, Tab. 133 and 134; *Willughby*, 119, Tab. 26; Storia degli Uccelli, ii. pl. 214. Phasianus Gallus Pumilio, *Latham*, Ind, Orn. ii. 627, var. n; *Gmel.* Syst. Nat. i. 738, y. Le Coq nain, *Buffon*, Ois. ii. 118; *Sonnini*, v. 183; *Temm.* Aig. et Gallin. ii. 244. L; Acaho ou Coq de Madagascar, *Buffon* par *Sonnini*, v. 182; Hist. Gener. des Voy. viii. 603. Le Coq de Java, *Bonat.* Tab. Enc. Orn. 182. Dwarf Cock or Creeper, *Lath.* Syn. iv. 705. Das Zwerghuhn, *Bechstein*, Nat. Deut. ii. 1288; agrees with our own except in size; *Temm.* ut sup. iii. 658.

Description.—This variety, which is not larger than a pigeon, differs from the Bantam chiefly in size, and in the shortness of its legs. The acaho of Madagascar is described as very small, with a circle of feathers about the legs, a thick tail, which it carries straight, and the ends of the wings black. Other varieties, said to come from Cambodia, and now found in the Philippine Isles, have the legs so short as to drag the wings on the ground. In addition to these, Buffon mentions a sort of fowls in Britanny, which are always obliged to leap, the legs being so short. These, however, are not small, but of the size of a dunghill fowl. The hens will hatch thirty eggs at a time, that is, more than double the number usually set under common hens. Some think that these dwarf fowls are the Hadrian breed mentioned by Pliny. Aldrovand describes the dwarf hen as all black, except the quill feathers of the wings, which are white at the ends, and on the neck are some white crescent-like spots, and a yellow spot around the eye. The head is furnished with a crest of feathers; the comb is small and dark colored; the feet are yellowish, and the claws equal and very white. Aldrovand does not mention the cock of this variety.

15. *Rumkin.*

Char. Spec.—Gallus ecaudatus, primus, *Temm.* Male with the comb entire; lower mandible with double wattles; no tail; rump with large covert feathers; body on both sides brownish-orange. Female not described. Coq Wallikikili, *Temm.* Pig. et Gallin. ii. 267. Inhabits Ceylon. Feet ash-grey; comb and wattles blood-red. Length 13 or 14 inches. This species is destitute of the rump and coverts. (*A.*) **Gallus ecaudatus, Domesticus. Tail or rump awanting, variegated with beautiful colors.** Gallus Persicus, *Brisson*, Orn. i. 174, No. 5; *Jonston*, Av. 58. Phasianus Gallus ecaudatus, *Latham*, Ind. Orn. ii. 627; *Linn.* Syst. Nat. i. 271, var. y; *Gmel.* Syst. Nat. i. 738; *Raii*, Synops. 51, a. 1 var. 3; *Frisch*, Tab. 131 and 132; *Borowsk*, Natt. ii. 181. Le Coq sans croupion, *Buffon*, Ois. ii. 122; *Sonnini*, v. 193, No. 16; *Gmel.* Trad. Franç. ii. 408, f; *Temm.* Pig. et Gallin. ii. 271. Persian Fowl or Rumkin, *Willughby*, Orn. 156, No. 6, Tab. 26. Rumpless or Persian Cock, *Lath.* Syn. iv. 705. Das Kluthuhn, *Frisch*, Tab. 131 and 132; *Bechst.* Nat. Deutschl. iii. 1287. (*a*) Das gehaubte Kluthuhn, *Frisch.* t. 130.

Temminck and other naturalists now consider this to be a distinct species rather than a variety, taking its origin from a wild species still to be found in Ceylon. It is distinguished by the want of a tail, by the comb not being in the wild birds indented, and with the wattles blood-colored rather than scarlet. The feathers are all of a dusky orange in the wild birds, but finely variegated in the tame ones. As these fowls were commonly domesticated in Virginia, Buffon erroneously supposed them to be indigenous to America. Although the wild species has not indentations in the comb, this is not the case with the tame ones, which have often a large indented comb. Aldrovand describes the cock as black interspersed with white, the rest white; the feet cinereous. The hen, he says, has a smaller comb than the cock, and is of a rusty color, except three black feathers in each wing.

From the rumkin being destitute of the gland on the rump, M. Reaumur derived one of his arguments against the almost universal opinion, that this gland is designed to furnish birds with a sort of oil with which to dress their feathers—an opinion not very tenable when closely examined. The rumkin has not the least vestige of this rump gland; but the place where it ought to be, as in other fowls, is more depressed than the rest, the flesh being smooth, and without any secretion or excretory ducts.

"All," says Reaumur, "have been of opinion that the feathers of birds, in order to be sheltered against rain, wanted to be done over with a kind of oil or grease, that might cause the water to run off them without penetrating them, and that this unction wanted to be repeated from time to time. In consequence of this, they have pretended to make us admire a reservoir of unctuous matter placed on the rump of each bird, out of which it expresses, and takes it with its bill to convey and spread it all over the feathers that require it. In order to expose a notion that must needs have been pleasing, since it is universally espoused, it need only be mentioned, that the feathers of the tailless or rumpless hens are as much proof against rain as those of other hens, and of many other birds that are provided with a rump in which the secretion of an unctuous liquor is effected."—(*L'Art faire eclore*, ii. 10.)

16. *Silky cock.*

Char. Spec.—Gallus lanatus, *Temminck.* Male and female white, with feathers like hair. Gallus japonicus, *Brisson*, Orn. i. 175, No. 6. Tab. 17. fig. 2, fem.; *Idem*, 8vo, i. 48. Phasianus Gallus lanatus, *Latham*, Ind. Orn. ii. 628; *Linn.* Syst. Nat. i. 271; *Gmel.* Syst. Nat. i. 739; *Borowsk.* Nat. ii. 180, g. Le Coq et La Poule à duvet, *Buffon*, Ois. ii. 121; *Idem*, Pl. Enl. 28, fem. domest; *Sonnini*, v. 190; *Bonat.* Tab. Ency. Orn. 183, var. g; *Gmel.* Trad. Franç. ii. 410; *Temm.* Pig. et Gallin. ii. 256. Silk Cock, *Latham*, Syn. iv. 702. Das Wollhuhn, *Bechstein*, Nat. Deut. iii. 1291. Inhabits China or India. This species differs in having the webs of the feathers disunited, and like hair; feet scaly, naked, or feathered; comb and wattles ruddy blue; skin and periosteum black; iris bright yellow; beak and feet blue. *Temm.* ut supra, iii. 661.

Description.—Modern naturalists make this also a distinct species. It has the whole body covered with feathers, the webs of which are so disunited as to appear like hairs, or glossy silk; the general color is white, and the legs covered wholly on the outside quite to the toes. As in other varieties, individuals of this sort differ in respect to color; some are pure white, others dingy-brown, but all of them with dark colored legs, on which, for the most part, are thick, stout, short spurs; though some are totally without spurs: nor are the legs always feathered. Both this species and the negro cock described onwards, have the outer skin and the bones black, and have grown into disrepute on account of the facility with which they contaminate our common poultry, so as to render them unseemly both in bones and wattles. They are indigenous in Japan, where they are valued, and also in China, where, however, they are rather scarce. The people in Canton carry them about in cages for sale to the European traders.

17. *Frizzled Cock.*

Char. Spec.—Gallus crispus, *Temminck.* Male and Female, feathers turned backward, curled up, variegated with fine colors. Gallus crispus, *Brisson*, Orn. i. 173, pl. 17, fig. 1; *Idem*, 8vo, i. 47; *Linn.* Syst. Nat. i. 271. n; *Raii*, Synops. 51, a 1, var. 4; *Gmel.* Syst. Nat. i. 738; *Frisch*, Tab. 135; *Borowsk*, Nat. ii. 180, Storia degli Uccelli, ii. pl. 215. Gallina Frieslandica, *Willughby*, Orn. 110. Le Coq à Plumes frisées, *Buffon*, Ois. ii. 121, Tab. 13; *Sonnini*, v. 189, No. 13; *Gmel.* Trad. Franç. ii. 408; *Bonat*, Tab. Ency. Orn. 182. d; *Temm.* Pig. et Gallin, ii. 259. Crisped or Frizzled Cock, *Lath*, Syn. iv. 704; *Bancroft*, Guian. 175, Descript. of Surinam, ii. 159. Das Strupphuhn, *Frisch.* Vog. Tab. 135; *Bechst.* Nat. Deut. iii. 1290. Inhabits Asia, Java, Japan; feathers curled up, quill-feathers without rays; some with the feet feathered, others naked.

Description.—The present species is commonly named the Friesland cock, from confounding the term "frizzled" with "Friesland." It is a native of Java, Japan, and other parts of eastern Asia. It is distinguished by having all the feathers turned and frizzled, being smaller than our common fowls, more wild, and less suitable for domestic purposes. The chickens are very sensible to cold, and especially to wet, and are seldom reared but for curiosity. Those which partake most of the original breed have white plumage and smooth feet. The flesh is firm and delicate.

18. *Negro Cock.*

Char. Spec.—Gallus Morio, *Temminck.* Male and female, comb and wattles black, variegated with gay colors. Gallus Morio et Mozambicus, *Brisson*, Orn. i. 174; *Idem*, 8vo, i. 48; *Willughby*, Orn. 298. Phasianus Gallus Morio, *Lath.* Ind. Orn. ii. 628, var. U.; *Linn.* Syst. Nat. i. 271; *Gmel.* Syst. Nat. i. 739, var. U. and V. Gallus Persicus, epidermide nigricante, S. G. *Gmel.* Voy. iii. 285. Le Coq Negre ou de' Mozambique, *Buffon*, Ois. ii. 122, Voy. de Siam, i. 279; *Marsd.* Sumatra, i. 188, Trad. Franç.; *Sonnini*, v. 191; *Gmel.* Trad. Franç. ii. 409 and 411, var. m. and n.; *Temm.* Pig. et Gallin. ii. 253. Blackamore Pullet, *Freyer*, Trav. 53; *Harris*, Coll. Voy. ii. 468. Negro Cock, *Lath.* Syn. iv. 704. Inhabits Africa. This bird differs from others, in the comb, wattles, skin, and periosteum being black, so that when boiled for table, it seems as if it had been boiled in ink. *Temm. ut supra*, iii. 660.

Description.—This is a native of Africa, distinguished by the comb, wattles, skin, and bones, being black, as are also the feathers, though the flesh is white and good. Those which have been brought to Europe are only kept from curiosity.

19. *Barbary Cock.*

This African variety is generally of a pale or dun color, spotted about the neck sparingly with black; the feathers there being very full; on the crown is a large tuft of feathers, of the same color with the body.

20. *Dutch Cock.*

This is usually termed the Pencilled Dutch, and is only a variety of the common dunghill breed, having white feathers spotted with black. These are regularly imported from Holland.

21. *Russian Cock.*

This breed seems to differ chiefly from others according to Latham, in having considerable tufts of brown feathers springing from each jaw, and others longer or fuller from the lower mandible, like a Jew's beard.

In the female, there is an upright tuft spreading out from the hind head, of the same silky texture. Independent of these, the cock has the usual comb and wattles, and the hen a small comb likewise. This sort is said to have come from Moscow, and varies in color, one variety being white, with the ends of the feathers glossy blue or black, giving it a spotted appearance; and the legs being covered with fibrous or downy feathers. Another has the plumage of the game-cock, or fine tawny orange, spotted with black.

A sort from Russia is mentioned in the Transactions of the Highland Society, vol. x. p. 144, as much esteemed in Scotland for prolific laying; but as no description of these is given, I cannot ascertain their identity with Latham's.

Ever-laying Fowl.—Any of the above breeds may become what is termed ever-laying, that is, not inclined to hatch, an artificial temperament produced by domestication.

Comparison of Sorts.—The things most necessary to attend to in selecting sorts for breeding, are the number, size, and flavor of the eggs, and the color and delicacy of the flesh.

Number of Eggs.—The Scotch Russian cross with the common breed, seems to stand highest, and next to those, the Dorking, Poland, and Spanish.

Size of Eggs.—The largest eggs are laid by the Poland, and Spanish, the next by the Dorking.

The game sorts, and all the small varieties, lay small eggs.

Flavor of Eggs.—The finest flavored eggs are those with bright orange yolks, such as are laid by the game breed, and by speckled varieties of the common breed. The large eggs of the Poland and Spanish have often pale yolks, and little flavor.

Color of the Flesh.—Those with dark colored or yellow legs, have the flesh of a less pleasing white than those with pale flesh-colored or white legs.

Delicacy of the Flesh.—The game breed, the Spanish, and the Dorking, are the most delicate; the Malay coarse and inferior.

From the Farmers' Series of the Library of Useful Knowledge.

ON THE CONVERSION OF ARABLE LAND TO PERMANENT PASTURE, OR MEADOW.

All kinds of grass derive their chief value from the quality of the soil on which they are produced; for, whether natural or artificial, they afford more nutriment when taken from rich land, than the same quantity of a similar sort will when procured from ground of a poor nature; and they are materially influenced by its state of wetness or of dryness. Every species springs originally from some peculiar earth, which is best adapted to its propagation; for although most of them will grow on various kinds of land, yet they all have their favorite ground, and if transferred from the soil on which they spontaneously vegetate, to one of a different nature, prepared for them by tillage, they lose much of their hardiness and durability.

It might be supposed, that, as almost every sort of grass can be made to thrive during a short period on different soils, a remedy for this could be found by sowing only the best class of seeds—and to a certain extent that effect may be obtained; but experience has proved that it is easier to accommodate the plant to the soil, than to adapt the soil to the plant, and all land has such a tendency to reproduce those plants which are indigenous to the soil, that, after a series of years, more or less, according to the care which has been bestowed upon its cultivation, they will supersede those which have been artificially sown. This forms, indeed, one of the strongest reasons why sound old meadow should never be broken up without mature consideration; for to reproduce it, is one of the most uncertain operations of husbandry. It is, therefore, evident, that the closer we adhere to those seeds which are natural to the land, the more healthy will the plants be found, and the longer will the herbage retain those properties which are essential to its perfection; though it certainly may be much improved by a judicious selection of the better kinds, and by sowing only certain quantities of each, according as they are found to flourish with the most luxuriance, instead of sowing them indiscriminately.

Every one who intends to lay down land to a permanent state of meadow or pasture, should therefore make himself well acquainted with the best natural grasses, and the peculiar soils to which they are indigenous, as well as with the state of the land in regard to shelter, drought, or humidity, as affecting their growth and durability; and, having become master of these particulars, he should then select the seeds accordingly, either by purchase from some seedsman whose character may be presumed to guard the buyer from fraud, or, if desirous of obtaining them of his own growth, he may avail himself of the directions to be found at foot.*

So far, however, are farmers from generally paying any attention to this subject, that when they are in want of grass-seeds, they take them without any discrimination from the bottom of their own or their neighbor's mow, without considering of what species of grass they are, from what land they have been procured, or whether they are adapted to the land on which they are intended to be sown; "if they are hay-seeds, they are satisfied."† This, however, is very short-sighted economy; for after land has been got into good condition, for the purpose of being converted into meadow, the further charge of the best seeds should never be spared.

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* "If a piece of ground can be had, that is neither very moist nor very dry, it will answer for several sorts of seeds, which may be then sown on one spot; but if such a piece cannot be obtained, they must be sown on separate spots, according to their respective qualities, no matter whether in a garden, a nursery, or a field, provided it be well secured and clean. Dig up the ground, level and rake it; then sow each kind of seed thinly in a separate row, each row about a foot apart and cover them over lightly with earth: the latter end of August, or the beginning of September, will be the most proper time for this business. If the weather be not uncommonly dry, the seeds will vegetate quickly, and the only attention they will require, will be, to be carefully weeded. In about a fortnight from their coming up, such of the plants as grow thickly together may be thinned, and those which are taken up, transplanted, so as to make more rows of the same grass.

"If the winter should be very severe, though natives, they may, as seedlings, receive injury; therefore, it will not be amiss to protect them with mats, fern, or by some other contrivance.

"Advantage should be taken of the first dry weather in spring, to roll or tread them down, in order to fasten their roots in the earth, which the frost generally loosens, and care must still be taken to keep them perfectly clear from weeds. As the spring advances, many of them will throw up their flowering stems, and some of them will continue to do so all the summer. As the seed in each spike or panicle ripens, it must be very carefully gathered, and sown in the autumn, at which time the roots of the original plants, which will now bear separating, should be divided and transplanted, so as to form more rows; the roots of the smooth-stalked meadow grass, in particular, creeping like couch grass, may readily be increased in this way; and thus, by degrees, a large plantation of these grasses may be formed, and much seed collected at its separate periods of becoming ripe."—Curtis on British Grasses, p. 31. Complete Grazier, 6th edition, p. 430.

Or, a piece of fine old meadow land, that is known to abound in the best sort of grasses, may be saved for seed, by letting it stand a few weeks longer than usual, and thrashing the hay out immediately, without suffering it to heat in the stack.—Middlesex Rep. 2nd edition, p. 305.—Com. to the Board of Agricul., vol. iii. p. 181.

An improvement on this latter mode would, however, be to divide the turf into three separate divisions, and to cut the grass from each at those different seasons when the plants respectively ripen their seeds, which usually is towards the latter end of June, the end of July, and in the first or second week of September; but great attention should be paid to the complete ripeness of the seeds, for if gathered before they are at perfect maturity, they will not produce plants.

† Holland's Survey of Cheshire, p. 186.

It is also the common practice of farmers, to sow those seeds with a corn crop, usually of barley; but, although they thereby save a year's rent and tillage, it is yet a losing plan in the end; for although the crop of corn thus obtained is valuable, yet when a good meadow is wanted, and when all the strength of the land is required to nurture the young grass thus robbed and injured, considerable expense is often incurred the second year for manure, which, with the charges of the crop, and the disadvantages attending it, will generally more than counterbalance its profit. A permanent sward of grass, with a bottom of richness and purity from weeds, can only be obtained by a thorough summer fallow,—so thoroughly effected as to cleanse the soil from every kind of weed, and to reduce it to a complete state of pulverization before the seeds are sown. By this means, they may be deposited in the ground early in the autumn—about the middle or the latter end of August; and if the land has been got into good heart by sufficient manure, and the seeds be judiciously chosen, they will then, not only stand the winter, but will probably sprout with such strength in the spring, as to prevent the propagation of weeds. A top-dressing of some friable manure or compost, which must be exceedingly well spread and minutely divided, should, however, be laid on in the course of the month of March, as early as the land will bear pressure, and the ground should be carefully hand-weeded, lest any noxious plants should arise. The expense, indeed, is considerable; but, as may be seen in the more serious affairs of life, so in no farming operation will half-measures be found to succeed; and when a man has such an object in view, as that of laying down land to produce crops without further cultivation during a series of years, he should calculate the loss which he will surely sustain, if he does not effect it in the most complete manner. The land should, in fact, be put in such order, as to produce nothing but what is intended to grow, and to bring that to the utmost perfection; but to carry it to that condition, no expense should be spared. If, however, the soil can be brought into good order by the means of a turnip fallow, then, indeed, the sowing of the grass-seeds may be deferred until spring; although, even in that case, we should recommend their being sown without corn: in proof of which, we may cite the following trials on three different sorts of soils, as stated by the late Mr. George Sinclair.*

Experiments.

1. A large field of *heavy clay*, in Buckinghamshire, which had been much exhausted by long continuance under the plough, was well cleaned, worked into as fine tilth as the unfavorable nature of the soil would permit, and manured with farm-yard dung and coal-ashes. The seeds were sown in August, at the collective rate of about four bushels to the acre, in different proportions in the order in which they stand; the largest being first, viz.—

Meadow fox-tail,
Meadow fescue,
Meadow cat's tail,
Rough-stalked meadow,
Crested dog's-tail,
White clover, and
Cow-grass.

The vegetation succeeded as satisfactorily as the season of winter would permit, but a top-dressing was given in the following spring, and a few more seeds were sown at the same time. The pasture soon became fit to receive dairy stock, and proved so productive, that, after four years' experience of its qualities, another field of a similar soil, on the same farm, was also laid down.

2. This, however, although worked in the same manner as the former, had the addition to the seeds of

Cock's-foot, and
Perennial rye-grass,

which proved a great improvement; and the field was intended to be sown in spring. In consequence, however, of the difficulty of getting a flat tenacious clay into fine condition, the ground was not sown until the beginning of summer; but, although the seeds vegetated freely, yet such a quantity of charlock came up at the same time, that the plants were in danger of being choked, and it became necessary to give so thorough a hand-weeding, that it cost 12*s.* per acre. The grasses, however, sprouted vigorously, and in the course of two seasons, became equal to any old pasture on a similar soil.

3. A ten-acre field of *strong loam incumbent on clay*, in a high and exposed situation in the county of Cumberland, got a fallow of ten furrows, and having been harrowed and picked, till not a weed was to be seen, was sown in drills, with thirteen pecks per acre, of the following seeds:—

Cock's-foot,
Perennial rye-grass,
Hard fescue,
Meadow fox-tail,
Tall oat-grass,
Larger meadow cat's-tail,
Crested dog's-tail,
Sweet-scented vernal,
Common meadow-grass,
White clover,
Perennial red clover,
Trefoil, and
Broad clover.

The next year, it carried upwards of forty wether sheep, with thirty-three lambs, and twenty yearling bullocks; thus keeping as much stock during the autumn, as a common turnip crop, and making the sheep equally fat.

4. *A light gravelly soil*, containing twenty-four acres, in Roxburghshire, was sown without a corn crop, on the 13th of April, 1832, with $2\frac{3}{4}$ bushels per acre, of

Cock's-foot,
Meadow fox-tail,
Pacey's rye-grass,
Tall oat-grass,
Mixed fescues,
Sweet-scented vernal,
Larger meadow cat's-tail,
Crested dog's-tail,
Common meadow-grass,
Broad-leaved bent, or fiorin, and white, perennial red, and yellow clover.

On the 28th of June, eight scores of Leicester ewes, with their lambs, were put upon this pasture, and remained there until the 4th August, when they were removed, but were replaced on the 13th by ten scores of ewes, without their lambs, which continued until the 4th of October, at which period the account ends.

On this, Mr. Sinclair very justly remarks, "that such extraordinary results could hardly have been expected, from what are called the artificial grasses, even if they were sown without a corn crop;" and he has stated that other experiments on various soils, and on extensive scales, have proved to him, "that, with clean preparation and judicious manuring, any land may be brought in a couple of years into a state of permanent meadow or pasture, nearly approaching to that of an ancient date, by sowing the seeds of the appropriate grasses." But, although entertaining the highest opinion of his judgment, yet in this instance we are inclined to doubt its accuracy, as all the information which we have been able to collect from other quarters shows that, after the first year or two, the luxuriance of the herbage declines, and is only after a long time so gradually renovated, as to acquire the richness and elasticity which is peculiar to an old sward. There, indeed, can be no doubt, that, by a skilful selection of the grasses most appropriate to the soil, a crop of herbage may be obtained of a quality so rich as to exceed that of the natural pasture during a short period; but that external coat composed of the tufts of grass or green turf, which we distinctively call *sward*, is formed by the roots, both alive and dead, and by the mould created by the decomposition of the latter, and therefore, can only be produced in a long course of years.

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* See the Quart. Journ. of Agric., N. S., Nos. xviii. and xix.; and also four other experiments of a nearly similar nature, published in the transactions of the Highland Society, N. S., vol. ii. p. 198.

Management.

The grasses, when sown, should be combined with perennial red and white clover, in various proportions, adapted to the distinct properties of the land; for although grasses differ from each other in their habits of growth—some putting forth foliage, ripening their seeds at different seasons, and yielding different qualities and weight of product—yet, should it be attempted to produce a rich sward by sowing the seeds of only one species of grass, it will be found, that however closely the seeds may be sown, and the seedling plants may cover the surface, yet a considerable number of them will certainly decay, leaving blank spaces to be filled up, either by the accidental mixture of seeds blown from natural pastures in the vicinity, or by those of weeds. It is, indeed, a law of the natural economy of permanent grasses, to grow densely and promiscuously together; for they are found, side by side, in the richest natural pastures in such variety, that twenty different species, containing more than a thousand distinct roots, have been collected from one square foot of surface. It is, however, essentially necessary that the seeds be genuine and pure, as well as of the last year's growth, and that they be so intimately intermixed, that, if possible, two plants of the same kind, should not grow up together. But if the proportion which will be hereafter mentioned be sown in sufficient quantities to stock every part of the land—and with an appropriate selection of plants, there can be little doubt, that, if the soil be otherwise properly managed, the seedling grasses will be sustained, and may be brought to assume the character of rich pasture or meadow.

The management of the soil can, however, be only judiciously effected when the land is intended to be laid down, by rendering it in every respect as perfect as it can be made by previous tillage and manure, either through draining, paring and burning, or completely summer fallowing; and by the application of farm-yard dung, lime, chalk, marl, ashes, clay or sand, as circumstances may require; then, by carefully extirpating all root-weeds during the next and following season, by which time the surface will become closely covered with a thick and permanent sward. It should not only be perfectly clean and well pulverized, but the ridges should be levelled, and the furrows filled in, so as to render the surface quite uniform, and the seeds should be sown on a fresh tilth, finely harrowed. As regularity in delivery of the seeds is a point of the utmost importance, an expert seedsman should be employed, and they should never be sown either in windy weather, or when the ground is so wet as to occasion the least degree of poaching. They are, indeed, sometimes sown by machines, in drills, in which they can certainly be evenly distributed, but the spaces between the lines must still be left void, and an experienced and careful workman can sow them perhaps more effectually broadcast. The light sorts should, however, be divided from those which are heavy, and they should be sown separately; for, although this will occasion more casts than one, yet the trouble of going several times over the ground, is not to be put in competition with the equal distribution of the seed.* They should then be lightly, but well covered in with harrows—not heavy, but formed with closely-set and very short teeth or tines; and if the soil is either spongy, or porous, it should be afterwards lightly rolled; though a large fold of five or six yards to each sheep, is a better mode of performing the latter. If the land be very light, or at all clotty, it is likewise advantageous to pass a light roller over it immediately previous to sowing the seeds. On strong land, however, rolling is not necessary; and as it is material, even on the very driest soil, to avoid the use of horses as much as possible on the ground after it is sown, it is very desirable to cover the seed with large hand-rakes, instead of harrows, so as wholly to prevent the foot-marks of the cattle.

The *best time of sowing* is, as we have already stated, *in the early part of autumn*—some persons even recommend the latter end of July;† but there can be no doubt, that, if the land can be got perfectly clean, it may also be advantageously performed in the spring. If the first plan be adopted, and the succeeding winter should prove severe, it is, however, not improbable that some of the seedling plants will fail, and therefore a small additional quantity of seed should be sown some time in February, or not later than the first fortnight of March, and then well rolled down, as the roots of the early-sown grasses may have been loosened by the winter's frost. If the land has been previously limed, pared and burnt, or marled, this will also be found the best time for laying on the farm-yard manure, which is necessary to afford nourishment and strength to the roots; and even if that should have been already applied previous to the sowing, yet a top-dressing of rotten dung, or a well-prepared compost of vegetable and animal matter, will occasion the plants to flourish: for it will be seen, that, like animals, the better they are supported in their youth, the stronger will they be when they grow up.

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* The weights of the seeds differ so materially, that while those of most of the clover species exceed 60 lbs., per imperial bushel; that of rib-grass, 50 lbs.; of meadow cat's-tail, 40 lbs.; and the different varieties of rye-grass vary from 18 to 30 lbs.; yet most of the poa and fescue tribes are under 15 lbs., and many of the other grasses below 10 lbs.

† Bailey's Survey of Durham, p. 181.

If, however, *spring sowing* should be chosen, then—if the land has not been previously prepared by a turnip fallow—the putrescent manure should be laid on before the seeds are put into the ground; if corn be sown at the same time, it should not be too thickly set, and the growing crop should be thoroughly hand-weeded. When the two crops are to be united, and the nature of the soil permits, barley is to be preferred to oats, for it has a greater tendency to loosen the texture of the ground, which is thus rendered favorable to the vegetation of the grass-seeds, and being reaped earlier, they will have the further advantage of being sooner exposed to the sun; for although a light crop of Lent corn is by many considered advantageous to their growth, by affording them shade and protection against the ardent heat of summer, yet, when they have acquired sufficient strehgth to be out of the reach of danger, it does them injury, as it protects every noxious weed equally as well as the young grass.*

The *management of the first crop* is a subject of much difference of opinion, some persons recommending it to be mown, while the greater number feed it off with sheep. The reason assigned for the former practice is, that by mowing it very early, and frequently rolling it, the grass acquires a closer bottom, and that sheep, in cropping the tender shoots of the seedling plants, pull some of them out of the ground. There may be some truth in this if the land be light, and sown, as such land frequently is, in the spring, though we have already seen, in experiment, No. 4, that even under those circumstances but little danger of material injury need be apprehended; but on strong soils, with autumnal sowing, the roots will have obtained too firm a hold of the ground to be destroyed by being fed in the following summer, and the land will thereby have the advantage of the dung.

Regarding the *soils most appropriate to the production of the permanent grasses*, it may be observed, that no land can be expected to form a good meadow, unless it be of a nature sufficiently retentive of moisture to afford nourishment to the roots, and to prevent them from being burnt up by the summer heats; though, if too wet, the herbage will become coarse, and infested with rushes and other aquatic plants. Loams are the best adapted, but they are too valuable to the arable farmer to be converted to grass; and, therefore, clays of so wet a nature as to be unsuitable to the plough, or else, land which, without regard to quality, is either subject to be overflown, or capable of irrigation, are the soils most commonly laid down. It must, however, be borne in mind, that, notwithstanding every care in the choice of the seeds, and the preparation of the soil for their reception, there are so many casualties which influence the growth of plants, that the difference of even half an inch in the quantity of rain which may fall in the course of the season will have a very decided effect in lessening the weight and value of their produce, although they may be of the like species, and in every respect, except as to soil and local climate, under exactly similar circumstances. Thus it has been justly observed by a late eminent botanist, that clear or hot sunshine may be highly beneficial on certain soils at a particular period of the progress of the crop, and on another and different soil it may be equally injurious; and moist or damp weather, varies likewise in its beneficial effects—or the reverse—according to the local circumstances of soil and site.

The *perennial grasses which are found in natural pastures*, amount to considerably more than a hundred different kinds; and there is no variety of soil, but is provided by the bountiful hand of nature with grasses peculiarly adapted to grow and remain permanent in each. However similar many of these grasses may be, when in a state of turf, no two species are found to agree in either the time of their being in the greatest perfection, the quantity or qualities of their nutritive matter, or any of the properties which constitute their value. Some are best for sheep, and flourish on elevated districts; others are calculated, on medium soils, for the dairy; and those on rich marsh lands for the fattening of cattle. Their periods of ripening are also different; and many, possessing different powers of withstanding the effects of drought or long-continued rains, consequently affect various kinds of soil.

The grasses which compose the produce of the richest natural meadow and pasture land, amount, however, to only between twenty and thirty distinct species, the rest being comparatively of little value, and of these, there is not a month, from spring until the close of autumn, but what, each in its particular season, occasions a superior luxuriance of growth, and brings them to ripeness. It will, therefore, be found, that by sowing the seeds of many grasses of dissimilar growth, there may be secured throughout the summer a succession of fresh herbage, so dense and abundant as far to surpass that to be obtained by the cultivation of only two or three species.* When combined, they

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* A practice prevails in some places, which consists in sowing half a peck of rape, or a bushel of spring tares, instead of corn, with the grass-seeds. The rape thus gets up sufficiently high to shade the young grass; and in the middle of July, ewes are turned in, with their lambs, to feed it off. This deserves attention; for the cole does not rob the land as corn does, while the feeding of it occasions a great increase of manure: the tares, however, are apt to smoother the young grass.

* On this subject, the observations which we have already made on hay-making, may suggest the advantage of having in the same meadow, those grasses which flower as nearly as possible at the same time; some farmers may, therefore, be convenienced by the following enumeration, calculated as nearly as possible upon an average of seasons and local climate:—

In *May and June*, meadow fox-tail, flote fox-tail, sweet-scented vernal-grass, narrow-leaved meadow-grass, clover.

In *June and July*, cock's-foot, crested dog's-tail, yarrow, bush-vetch, waved-hair and water-hair grass, tall oat and yellow oat-grass, perennial rye-grass, fine and creeping bent, all the species of the fescue, and the poas, or meadow-grasses.

In *July and August*, flote fox-tail, fiorin, water-poa, or reed meadow-grass (which is the latest of the poas,) and meadow barley.

The seeds of these grasses are generally ripe about vary according to the nature of the land; thus—

Sandy soils are generally stocked with hard and smooth fescue-grass; sheep's fescue; crested dog's-tail; smooth-stalked and meadow soft-grass; oat-like soft-grass, and some creeping plants of little note.

Calcareous soils abound with white clover; rough cock's-foot; meadow, hard and sheep's fescue; perennial rye-grass; upright perennial brome; rib-grass; yarrow; burnet; yellow oat, and sweet-scented vernal-grass.

Argillaceous soils encourage meadow fox-tail; meadow cat's-tail, or timothy grass; cock's-foot; tall and meadow fescue; tall and yellow oat-grass; rib-grass; yarrow; bush-vetch; sweet-scented vernal and perennial rye-grass.

Peaty soils have been found to contain sweet-scented vernal-grass; rough cock's-foot; meadow soft-grass; meadow fox-tail; meadow cat's-tail; creeping bent, and crested dog's-tail.

Fenny soils produce creeping bent, or fiorin; flote fescue; flote fox-tail; water-hair grass; and water-poa, or reed meadow-grass; and generally the usual aquatic plants.

A mixed soil, composed of these earths—sand, chalk, and clay—is found to give vigor to the following permanent grasses, of the qualities of the chief of which, and some of their varieties, we annex a brief description, together with some notes made by Mr. Taunton, a gentleman well known as an agriculturist, who, in 1823, sowed a great number on separate plots of a field of five acres of hazel-colored loamy sand, upon a chalky sub-soil; as well as upon some calcareous heights in the county of Surrey; and which, since that period, have never been manured, nor in some years, either mown or fed, until 1832, when his remarks were made.* Of these, several are known by the collective names of "*Poas*" and "*Festucas*," from these being the terms respectively applied to them by botanists: terms which we also retain in compliance with a custom lately introduced by almost every one who writes upon agriculture, though we cannot help thinking, that, among farmers, it savors more of affectation, than of any real knowledge of botany. Many of them, however, being only unimportant varieties of the same species, will not be here noticed, as those who may wish to ascertain the distinctive properties of each, will find a minute and scientific description of every class of the natural as well as cultivated British grasses, in the "Hortus Gramineus Woburnensis" of the late Mr. Sinclair—a work which should be in the hands of every intelligent farmer.

Poa annua, or annual meadow-grass, is not, as its name implies, permanent; yet, being in flower at different periods during the whole of the summer, it produces seeds, even when mown or fed, which spring again, and thus it forms a part of the sward as constantly as if it were perennial. Cattle of every kind are fond of it, and it is thought to have a peculiarly good effect upon milch cows in improving the quality of the butter; though its produce is comparatively small.

Poa pratensis, or smooth-stalked poa, is one of the most useful grasses, for it vegetates in the driest soils, supports its verdure during the winter, and in the spring throws out numerous shoots for early pasture: the hay is also of fine quality, and it flowers in the month of May.

Poa trivialis, or rough-stalked poa, bears a considerable resemblance to the preceding, both in its appearance and in the value of its hay; but its other properties are in some respects widely different, for while that flourishes in dry land, this is chiefly found on low meadows or moist pastures, and is therefore well adapted to ground which is intended to be irrigated. It also flowers rather later than the former, and is a tender grass, liable to be injured both by severe cold, or by excessive drought. It, however, affords abundant herbage, and, in places suited to it, grows to such a prodigious length, that it is said to have been found in the famous Orcheston Meadow, near Salisbury Plain, full eight feet long.*

Poa compressa, or creeping poa, flowers during the greater part of the summer, and is considered one of the most valuable of the tribe; for its dark green leaves, grow so firmly together, as to form a short turf of the richest pasture, which is supposed to contribute much to the delicate flavor of the flesh of sheep and deer, to which animals it is peculiarly grateful.

Poa angustifolia, or narrow-leaved poa, is a rich grass which delights in calcareous sandy soils, as well as in loamy clay; but, being a running-rooted plant, it should be only sparingly introduced among other grasses.

Poa nemoralis, or wood-meadow grass, has the peculiar property of flowering under the shade of trees, which renders it valuable on land which either contains forest timber, or which is closely fenced by plantations; but Mr. Taunton says, that in several beds of considerable extent, on which he has sown it, the plants were completely overpowered by other grasses; this was also the case with several different varieties of the poa species, as well as with many other grasses, which he inclines to attribute to the seeds being sown in too large quantities.

Festuca pratensis, or meadow-fescue, is a hardy plant, which bears broad succulent leaves, and, though a coarse grass with very hard stems, is well adapted to almost every kind of land, but more particularly to loams, active peat soils, or healthy well-drained clays: grows naturally on all pasture land that is not too dry. It is of very quick growth, produces an abundance of sweet herbage, which is much relished by all sorts of cattle, makes good hay, and flowers about the middle of June. Its seeds are also very abundant, and easily collected.

Festuca elatior, or tall fescue, Mr. Taunton considers as both the largest and most vigorous plant of which he is possessed. In a small meadow, on a loamy clay, which has not been manured for these nine years, but in which it forms a principal,

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a month later; and care should be taken not to gather them, until in a perfect state of maturity, or the plants will fail.

* See the Quarterly Journal of Agriculture, N. S., vol. iii. p. 406.

* Papers of the Bath Agricultural Society, vol. ix. p. 154. Both species propagate themselves, but very slowly, by the roots; and, therefore, if not occasionally allowed to perfect their seeds, they will be subject to decay, unless fresh seeds be sown: in which case they should be separated by being well rubbed in a sufficient quantity of dry sand or lime, as they are connected by filaments which cause them to cling together. Those of the former are blunt; the latter pointed.

he still cuts two tons of hay to the acre; and he finds that both these species also abound and increase on the better specimens of calcareous loamy sand.

Festuca ovina, or sheep's fescue, forms a thick and fine turf on dry sandy soils, and on elevated land, forms a pasture which has been much recommended for sheep; but according to the experience of an eminent agriculturist, this species of fescue, and its other numerous varieties, have been described, from repeated observation, as being constantly refused both by sheep and all other cattle, whenever they could get any other kind of food.* It is, however, found very commonly upon the downs, together with the *festuca duriuscula*, or hard fescue, the *festuca glabra*, or smooth fescue, the *festuca cambrica*, or Welch fescue, and the *festuca rubra*, or creeping fescue, which are therefore all well adapted to poor land; and their herbage being nearly evergreen, has been described by Mr. Sinclair, as invaluable for winter pasture.

Festuca loliacea, or darnel-like fescue, in some respects resembles rye-grass, and has been supposed by botanists to be a hybrid plant, produced by rye-grass and flote-fescue; but this is a mistake, as the darnel both springs earlier and is superior in produce to rye-grass.†

Lathyrus pratensis, or meadow vetchling, furnishes a copious, succulent and tender herbage of very considerable bulk, is relished by cattle, and forms an important addition to the crop of hay, though it flowers late. The *vicia sepium*, or bush-vetch, which is a variety of the former—both being species of perennial tares—flowers earlier, though not until July, and some extraordinary instances of its product have been recorded in different experiments regarding its culture.‡ Mr. Taunton found that they had spread both on his sandy loam and upon his clays; but although the latter had the advantage in point of increase of plants on the light land, yet the produce was not so large as upon a more clayey soil.

Plantago lanceolata, or rib-grass, though generally combined with other grasses, yet has been sown without admixture, and produces a considerable herbage on rich sands and loams, and on poorer and drier soils answers well for sheep; being much used on the hills in Wales, where its roots spread and occasion a degree of fertility in districts which would otherwise be little better than bare rock. But botanists differ in their estimation of its qualities, for by some it is said to be injurious to cows, and by others, it is asserted that the richness of the milk in the celebrated dairies of the Alps is attributable to this grass, and the common lady's mantle, or *alchemilla vulgaris*. When sown along with clover, it is also said to prevent cattle from being hoven.||

Poterium sanguisorba, or burnet, is also frequently sown alone, and is considered as the best adapted of all forage plants to bear the rigor of winter in exposed situations; it is, therefore, much used by stock-masters, particularly for sheep, as it supplies an important addition of food in the pinching season of the early part of spring; but if made into hay, when uncombined with other grasses, it is coarse and unpalatable. By itself it is, indeed, an inferior food; for although it possesses a tonic and aromatic property, which renders it of considerable value when mixed with the grasses of the elevated pasture of the downs, and it is there invariably cropped close to the ground, yet if grown separately, it is rejected by all stock, unless they be pressed by hunger. When intended for summer pasture, or for hay, it should therefore be joined with other grasses; or, at least, with white clover, which will both render it more palatable, and afford a heavier crop, than if sown alone. On poor chalky soils, it has also been tried with good effect in combination with cock's-foot, and also with small quantities of meadow-fescue and perennial-fescue; and its hardy nature on soils of that description, renders it worthy of attention. It forms, indeed, a large portion of the natural herbage on some extensive tracts of the South Downs, and although most abounding on chalk, it thrives also in both sand and gravel.

Alopecurus pratensis, or meadow fox-tail, which is one of the earliest and most valuable grasses produced in our climate, vegetates with extraordinary luxuriance, and is therefore abundant, both as a first crop and as after-grass; it is therefore justly considered as holding the first place among the best grasses, whether used green as fodder, or made into hay, and cattle are very fond of it, though it is said to be less relished by oxen, than by other stock. It produces a great quantity of seed, which may be easily gathered while the grass is growing, as it overtops most others; but the seeds are seldom found in hay, for they generally ripen and fall out before the other grasses are ready to be mown. There are two other species of the fox-tail, which all flourish chiefly on strong moist soils, but, although each bearing nearly the same character, this is the best. Mr. Taunton says, that on his dry ground, he found them all considerably weakened, and that one of them—a German black-seeded species—had nearly disappeared; but where they were mixed in a meadow on clay, with a dark moory mould on the surface, they each maintained their size and bulk as well, or better, than any other grass. They indeed grow to great perfection on all moist loams and clays; and although not cut until late in the summer, when the radical leaves of many other grasses are decayed or withered, these continue green, and present no impediment to the scythe. "In fine, it possesses all the requisites of a good grass—namely, quantity, quality, and earliness." It yields also abundance of seeds, but they are subject to be destroyed by an insect.

Cynosurus crystatus, or crested dog's-tail, grows upon sandy and calcareous soils, and is, therefore, well calculated for dry upland pastures, where it forms a thick, short turf, and affords wholesome food for sheep. It flowers about July; but the variety called *Cynosurus cæruleus*, or blue dog's-tail, which is found upon the tops of the highest limestone rocks, is one of the earliest grasses, and as it endures the summer drought, is therefore well calculated for sheep pasture.

Phleum pratense, or meadow cat's-tail, of which there are two varieties,—the larger and the less,—

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* Essay by George Tollet, Esq. Comm. to the Board of Agric. vol. iii. p. 428.

† Sinclair, Hort. Gram. Woburn., p. 179.

‡ Withering on British plants, vol. iii.; and letters in the papers of the Bath Society, vol. iii.

|| Cheshire Report, p. 181.

is also known as "Timothy-grass," under which name it has been extensively cultivated, uncombined with other grasses, in America, where it produces very large crops, and when first imported into this country was supposed to be a new species. It is chiefly produced on moist and rich loams and peaty soils; was found by Mr. Taunton to have nearly vanished from his chalk and rich loamy sand, and to have entirely disappeared from the poor calcareous heights. The first variety is said by Mr. Sinclair, to be the most valuable for pastures of the first and second quality of land; yet the second is superior, particularly for winter food, in the poorer soils. On the elevated declivities of clay soils, it pushes up shoots of great succulence, which, if neglected in the summer, are rendered palatable to stock by the frost.* When used for green food, for which purpose it is peculiarly calculated, it yields abundantly throughout the summer, and is well relished by cattle, if kept close fed down; but if made into hay, it should be cut before it comes into flower, as the stems will otherwise become as coarse as straw: it, however, flowers late, and may, therefore, be advantageously mixed with other meadow grasses, though its seeds are small and difficult to collect.

Dactylis glomerata, or rough cock's-foot, flowers in June, and is also sometimes cultivated alone, but in that case it should be likewise cut early if made into hay, or kept close fed down; for, if allowed to become rank, it grows very coarse, and will in that state be rejected by cattle, though in its young growth they readily eat it, and sheep have a decided liking for it. If allowed to get up, it also forms large tufts of a very unsightly appearance, which overpower the other grasses. It produces very abundant crops upon land of a medium quality, on most of which it is very common; but light sands, or chalky downs, and either a total want of clay, or very stiff and wet clays, are alike unfriendly to its growth. It springs early, which is an essential point in pastures; and, if made into hay, it quickly yields an abundance of after-grass. If sown alone, two bushels per acre is the usual quantity; and as it thrives with great luxuriance under the shade of trees, it is a valuable plant to be sown in orchards.

Avena elatior, or tall oat-grass, though a coarse plant, yet vegetates with great luxuriance; but, according to Sir Humphry Davy, though very productive, it is disliked by cattle, especially by horses, which, he says, perfectly agrees with the small portion of nutritive matter which it contains. He adds that it thrives best on strong tenacious clay; but Mr. Sinclair states that its variety, the *Holcus avenaceus*, or tall oat-like soft-grass, though found in clays and shady places, is natural to sandy loams.†

Avena flavescens, or yellow oat-grass, though another variety of the above, is stated by Sir Humphry Davy, to thrive so much better on calcareous soils, that its produce has been doubled by a top-dressing of lime; but that, although not liked by cattle, it is said to make good sheep pastures. As they both, however, seldom flower before the beginning of July, they are generally mown before that time; and, therefore, being thus comparatively tender, this dislike, if it really exists, is not observeable in the hay. Mr. Taunton says, that cattle are very fond of it; and the Rev. Arthur Young states it to be a profitable grass "when kept close fed."* This difference of opinion we must leave to the experience of others to reconcile, only remarking, that we have never heard any objection made to it by farmers; as well as that of Mr. Taunton, regarding the soil to which it is most appropriate, for he says, "that in parts where the soil was too light to encourage its luxuriant growth, it dwindled and became insignificant, but that it appears to cherish a considerable affection for argil." He adds, however, "that it is so rich in its qualities, and so universal a citizen of the world, that there is no soil, from the lightest calcareous loam, to the stiffest clay, into which he would not introduce it, where he intended to produce a permanent turf."

Achillea millefolium, or yarrow, is one of the most common as well as one of the most valuable of our grasses, as it has been found to form part of all our richest pastures, and is so grateful to every species of stock, that it is close fed down as fast as it springs, thus frequently escaping observation unless the turf be attentively examined. A considerable prejudice was, however, formerly entertained against this plant, which was by many persons considered worthless, or even injurious to cattle, until the contrary was proved by Dr. Anderson,† and confirmed by Sinclair, who, however, considers it beneficial to stock, rather as a condiment, than as affording direct nutritive matter. It suits almost every species of soil, and possesses besides the faculty of resisting drought on arid land. It flowers about the end of June, or the beginning of July.

Holcus lanatus, or woolly soft-grass, called also "Yorkshire white," flourishes about the latter end of June, in moist, sandy situations, and together with another variety, the *Holcus mollis*, or common soft-grass, is chiefly used on sheep walks, and answers well for that purpose, but is not relished by other cattle, and is said to occasion a violent discharge of urine and general weakness, if given to horses.

Anthoxanthum odoratum, or sweet-scented vernal, is one of the earliest of our grasses, and grows on almost every kind of soil. Although neither very productive nor nutritive, and far from being a favorite with cattle when given to them alone, it yet possesses a peculiar value of being the only fragrant plant natural to our fields, and imparts the delightful perfume which is so perceptible in new hay. It, indeed, forms a part of the herbage on all good meadow land, and although its chief utility seems to consist in giving flavor to the dried fodder, yet, when thus mixed, it is grateful to all stock, and, therefore, should always be sown with the other seeds of permanent grass.

Lolium perenne, or perennial rye-grass, contains upwards of sixty varieties, some of which are annual. It has been so anciently cultivated in England, that it is mentioned in "Worlidge's Husbandry," in 1677, since which time there have been numerous improvements on the common sort, of which those best known are Pacey's, Russell's, Whitworth's, and Ruck's, which are all considered perennial. Mr. Taunton, however, observes, "that not only in his experimental ground, but in his field culture, on chalks, and on the deepest and richest loamy sand, he has experienced the utter eradication of every variety of the most approved species; though he does not feel himself warranted to infer that there is no species of rye-grass which is perennial on certain soils, as his experience induces him, on the contrary, to believe that in different parts of the kingdom it is indigenous." It is, notwithstanding, found to flourish on most kinds of soil, and grows under circumstances of different management on many upland situations, though sound and somewhat moist midlands are the most appropriate. It soon arrives at perfection, and produces in its first years of growth a good supply of early herbage which is much liked by cattle, and has been described by Marshall, as of such forcing quality, that, "no matter how short the first spring grass may be, so the cattle can get hold of it, they are sure to thrive amain.*" This, however, may be easily accounted for, as there is not at that season of the year another blade of grass to lower its value.

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* Sinclair on the grasses best adapted for winter pasture: Prize Essays of the Highland Society, No. xx. p. 32.

† Davy's Lectures on Agric. Chem., p. 368. Sinclair on the grasses best suited for winter pastures: Prize Essays of the Highland Society, No. xx. p. 32.

* Davy's Lectures, p. 369. Tollet, Comm. to the Board of Agric. vol. iii. p. 433. Young, *ib.* 146.

† Essays, vol. ii. p. 252.

These apparent merits have doubtless upheld its use among farmers as a favored grass, and it is not uncommonly sown in arable land, along with clover, for a single crop; but the lattermath is very inconsiderable, and it impoverishes the soil in a very great degree, if the culms—which are invariably left untouched by cattle, when they grow strong and coarse—are not cut before the seed arrives at perfection. Notwithstanding this, it is, however, sometimes left to stand for seed, in which case it is thrashed like other grain, but the straw only serves as litter. To this we have also to add, upon the authority of Mr. Sinclair, that if the nutritive powers of rye-grass be compared with cock's-foot, it will be found inferior in the proportion of nearly five to eighteen; also inferior to meadow fox-tail in the proportion of five to twelve, and to that of meadow fescue, as five to seventeen.† The chemical analysis on which he founds that assertion must, however, be received with some degree of caution; for it unquestionably does not accord with the experience of farmers.

There is, however, another species of this plant which has been lately introduced from the continent under the name of *Italian rye-grass*, and is distinguished from the common species by its larger leaves, by being of a darker green, and by growing to a greater height. On comparative trials with some of the most favorite kinds of the common rye-grass, it has been found to exhibit a great superiority of growth, and it has been represented as being softer, more juicy, and more greedily eaten by cattle, whether in a green or dry state. It is also said to be of such a hardy nature, that, when cut in November, it has put forth fresh shoots of a foot in length in the close of December, and has been found to stand the winter in the north of Europe. Its durability in the soil, as a perennial grass, remains yet, however, to be proved; and, although the experiments which have been already made, seem to confirm the high character which has been given of it in other respects, yet further experience seems necessary to determine its real value.*

Trifolium repens, or white clover, is also known under the name of "Dutch clover," from our having first learnt its use from the Flemings, and from large quantities of the seed being imported from Holland. Its favorite soil is limestone, but it is one of the most general grasses throughout this country, being found in almost every situation from the lowest to the highest meadow, though on very poor land, it is often so small, and grows in such a creeping manner among the lower leaves of other herbage, that it is scarcely perceptible until brought up by top dressings; which probably has given rise to the very general opinion, that it is indigenous to some soils. The central root penetrates to a considerable depth, and the plant is thereby enabled to resist the effects of drought, particularly on sandy soils: the branches which trail on the surface send fibrous roots from their joints down to the ground, and hence this species of clover maintains itself in land of opposite qualities; for if the surface be too dry to afford nourishment to the foliage, it is preserved by the roots. It is not, however, so nutritive as the common annual red clover, nor does it form a good pasture when sown by itself, for it has been found to occasion disease in sheep; but, combined with other grasses, it is a valuable plant.†

Trifolium pratense, or native red clover, known also by the name of "marl-grass," is a perennial plant, while that species, which also bears blossoms of the same color, and is so generally cultivated in arable land, is only biennial. There is likewise a variety termed "cow-grass," which is still more permanent than the former, and is therefore more generally sown among grasses. This bears a rich purple flower, which comes into bloom in the month of July, and was found by Mr. Taunton to furnish a darker colored and heavier swath than any other part of his experiment ground; it is, therefore, decidedly perennial; and, considering that no manure had been applied to this spot during the previous eight years, it proves that it will clothe even a light sandy soil with luxuriant herbage.

Ranunculus acris, or butter-cup, and *Rumex acetosa*, or sorrel, are only noticed to be avoided, for although they are both found in our pastures—the former particularly in some of the richest—yet they are never seen to be eaten by cattle of any description, unless pressed by necessity. The presence of sorrel also indicates a state of acidity in the soil which can only be corrected by the application of lime.

From this number, any intelligent farmer may select those seeds which are the most appropriate to his land; for it is very difficult to furnish any general rule on the subject. On laying down land of a medium quality, without reference to any particular soil, the following will probably, in many cases, be found the most useful. The quantity to be used must, however, be varied according to circumstances, as the proportions of the different species to be sown must always depend on the nature of the soil; and if every kind should not be sown, the others should be increased accordingly.

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* Rur. Econ. of Gloucestersh., vol. i. p. 162.

† Hort. Gram. Woburn., p. 215.

* In the *Bulletin des Sciences Agricoles*, it is stated to be generally sown in the autumn, at the rate of 16 to 18 lbs. per acre, and the seed rolled in; that in the next autumn, the turf is covered like an old meadow, and the crop of the following year is more than double: its growth, also, is so rapid, that if sown with clover or lucerne, it will quickly choke them.

† Sinclair, Hort. Gram. Woburn., p. 223.

Smooth-stalked poa,	8 quarts.
Rough-stalked poa,	8 "
Meadow fescue,	12 "
Meadow fox-tail,	8 "
Crested dog's-tail,	6 "
Rib-grass,	4 "
Timothy-grass,	4 "
Yellow oat-grass,	4 "
Perennial rye-grass,	12 "
Cock's-foot,	4 "
Yarrow,	4 "
Sweet-scented vernal,	2 "
White clover,	6 lbs.
Cow-grass and annual meadow-grass.	4 lbs.

The common practice is, with the exception of clovers, to sow those seeds by measure; but it has been suggested by Mr. Lawson, of Edinburgh, seedsman to the Highland Society, that it would be more correct to sow them all by weight; "for although in grass-seeds, the greater weight of one is no criterion of its superiority over another variety of less weight, yet a greater weight in the same variety, always denotes a superior quality. Thus when seed is light, and consequently inferior, the greatest number of seeds is obtained by adhering to a given weight; and hence there is the chance of nearly an equal number of plants springing up as when the seeds are plump and heavy." With this view he has given several tables regarding the application of the different seeds under various circumstances; one of which we here select, and refer our readers for the remainder, to his essay in the Quarterly Journal of Agriculture.*

For Permanent Pasture, per Imperial Acre.

	Light soil.		Medium soil.		Heavy soil.	
	With a crop.	Without a crop.	With a crop.	Without a crop.	With a crop.	Without a crop.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Perennial rye-grass,	12	24	12	24	12	24
Meadow fox-tail,	1¼	2½	2	4	3¼	6½
Timothy-grass,	—	—	1½	3	3¼	5½
Meadow fescue,	2½	4	2½	4	2½	4
Cock's-foot,	5	8	3¼	6½	2½	4
Rough-stalked poa,	—	—	1¾	3¼	3¼	6½
Smooth-stalked poa,	3¼	6½	1½	3¼	—	—
White clover,	5	8	5	8	5	8
Red clover,	1½	2½	1½	2½	1½	2½
Hop-clover, or trefoil,	1½	2½	1½	2½	1½	2½
Cow-grass,	1½	2½	1½	2½	1½	2½
	33½	60½	36	63½	36¼	66

We have reduced the above, as nearly as we could, without descending to fractions, from the weights given for the Scotch acre; and although we are of opinion that a more complete selection might have been made, yet it will serve to call attention to the principle on which the table has been framed.

There is a very large tract of land, called *Stonebrash*, which extends from the north of England through Warwickshire, Gloucestershire—the Cotswold hills being almost wholly composed of it—with some parts of Wiltshire and Somersetshire. Under the greater portion of this district there are beds of marl, which have been very much used in the conversion of arable to grass, and with such extraordinary advantage, that the value of the ground is said to have been in some instances trebled, and even quadrupled, in value. The grasses usually sown are—

Perennial rye-grass,	1 bushel.
Marl, or cow-grass,	10 lbs.
White clover,	3 lbs.
Hop-clover, or trefoil,	1 lb.

The grasses are sometimes mown and sometimes fed in the first year, though the latter is considered the better practice, and the marling does not take place until the following July, as it is necessary that the land should be well covered with grass when the marl is laid on; for if the surface be naked, it will cake, and the summer's heat will burn up the young plants. No natural grasses are sown, but they come up spontaneously, and in about three years, they take place of those which are artificial. From that time—as we learn upon the authority of Mr. Davis of Longleat, the surveyor of Wiltshire—the land continues, for the space of nearly twenty years, and sometimes more, to be equal to the best native meadow-land in the country; but after that period, the marl sinks into the ground below the reach of vegetation, the grasses decay, and mosses take their place. When again ploughed up, it, however, bears several crops of corn previous to a repetition of the marling, which is done in the same way as at first, and with equal success.†

Nearly the same plan of seeding has been followed in Dorsetshire and some other places, which do not possess the advantage of marl, only varying the quantity of all the seeds except rye-grass, to equal amounts of six or seven pounds each. By this means there is an almost constant supply of feed: for the hop-clover and rye-grass supply it early in the spring; the cow-grass is in perfection in July, when the former decline; and the white clover from August to the remainder of the season. The grasses, however, only last during five or six years.[*]

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* New Series, No xxiii.

† Comm. to the Board of Agriculture, vol. iii. p. 90.

Aquatic Grasses.

When, however, the soil is chiefly composed of one principal ingredient, as, for instance, if chalk, peat, or very wet clay, greatly predominates, but few of the grasses will grow in combination. Thus several of the aquatic species which are found in wet low lands and boggy soils, will, however thickly sown, ultimately become solitary: of this nature are—

Alopecurus geniculatus, or flote fox-tail, which grows in situations so liable to inundation, that the other good grasses, if sown there, are soon expelled. In respect to the degree of moisture which it will support, it stands between the rough-stalked poa and the flote fescue, and thus forms a connecting link between our fens and moister meadow lands; for it is found in some of the richest marshes, and is then much esteemed for its fattening qualities, in pasture as well as for hay. It is a creeping plant, which flowers in May and June, and grows from the centre in a nearly horizontal position, the lower joints touching the ground, and it may be propagated by slips.[†]

Festuca fluitans, or flote fescue, which grows sometimes in water and sometimes out of it, yet cattle are so fond of it, that they often endanger themselves to get at it, and it is said that the Cheddar and Cottenham cheese owe to it much of their celebrity. It springs early, and, when made into hay, it is soft and pleasant, if cut in the sap, and bears a bluish green color. There is also a variety called *festuca loliacea*, which flowers in June and July, and is found in marshy situations, where it is considered a valuable grass, but it has a coarse, broad, reed-like foliage.

Aira aquatica, or water hair-grass, which is found in a wild state on the margins of pools of standing water, where it flowers in June and July, and is grown in some of those fens which have not been perfectly drained, is also said to contribute much to the fine quality of the Cambridge butter.

Poa aquatica, or water poa, also called reed meadow-grass, flowers in July and August, and is very highly esteemed throughout the fen-lands of Cambridgeshire and Lincolnshire. It is, indeed, so particularly abundant as well as so much valued in the Isle of Ely, that it there forms a great source of their dairy riches, being considered excellent food for cows, though not relished by horses, and grows to the great height of six feet; it is, however, usually cut when about four feet high, and is bound up into sheaves. When stacked, and lightly fermented, it acquires a white surface, and is provincially termed "fodder," to distinguish it from other kinds of coarse grass, which are called "stover." Immense tracts which were formerly overflowed are now covered with this plant, which, from its strong stem and upright growth, is suited to places unfit for the finer grasses: there is also a variety, known as *poa fluitans*, or flote poa.

Some of these have in many instances been sown among the grasses recommended for laying down meadows, and in most wet soils, they deserve attention; for, on land where they thrive, they produce a great abundance of valuable fodder. There is, however, no species of aquatic grass which has of late years attracted so much attention as that called

Agrostis stolonifera, or creeping bent-grass, now more generally known as "Fiorin"—signifying, as we understand, in the Irish language, "grassy," and which much resembles the water hair-grass; but of which there is also a variety called the "broad-leaved bent." This, though formerly well known as a weed, was only introduced to public notice as a cultivated grass within the last twenty years, when it was so highly extolled by the Rev. Dr. Richardson, of Clonfecle, in the county of Antrim, that it soon attracted general attention, and, after minute investigation of its merits by several eminent agriculturists, the Doctor was honored with a medal by the Board of Agriculture. In an account published by the Agricultural Society of the Stewarty of Kirkcudbright, some of whose members visited Dr. R.'s farm for the purpose of examining its qualities, it is described as putting forth a great profusion of lateral strings, like the side shoots by which strawberry increases, and by which it is propagated; but the roots penetrate but a short distance into the soil, thus denoting that its chief sustenance is drawn from the atmosphere, and it is represented—

1st. To grow luxuriantly in low and swampy grounds, which, but for the cultivation of it, would be of little or no value.

2ndly. That it grows in such great quantities in irrigated meadows, which are most favorable to it, that it has been known to produce above four times the weight of any single crop in general reared of any other grass.

3rdly. That all cattle are so extremely partial to it, as to prefer the hay made from it to any other hay whatever; and that, from the length of time which it annually vegetates, it may be used as green food during the greater part of winter.[*]

It, indeed, preserves its vegetable life so long, that it continues in vigor from the beginning of October, until the end of March, and has not only been actually made into hay in the month of December, but when allowed to lie uncovered in small cocks, it did not rot as common hay would have done. As this, however, is a tedious and troublesome process, it is better to give it to cattle green, upon the soiling system, as it does not admit of being pastured; and it has been found to occasion a great flow of milk in cows, as well as to give it a good flavor and superior richness.[†]

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[*] Ibid. p. 10.

[†] Survey of the county of Antrim, part i. p. 250.

[*] *Farmer's Magazine*, vol. xiii. p. 4. Dr. R. has stated, upon the oath of the person who measured the ground and weighed the hay, "that one portion, not manured the preceding year, produced at the rate of 6 tons the English acre; that another portion, which had been manured, yielded at the rate of 7 tons, 4 cwt. and that when weighed, the hay was dry, rattling, and merchantable between man and man by weight."—Ibid. vol. x. p. 508.

[†] It has been stated, on the authority of Sir James Stewart, of Coltness, Bart., that the average produce of butter fed, sometimes with 8 lbs. of steamed potatoes, with an unlimited quantity of oat-straw, and at

There is, however, this inconvenience in giving it in that state—that, being a jointed plant, and very tenacious of the power of vegetation, any part of it which happens to be left by the cattle, and is thrown out upon the dunghill, if afterwards laid upon arable land before it is completely decomposed, will there take root, and spread in a manner which renders it very difficult to be got rid of: it has even been thus found to spring up when taken from the hay-rick.

Although it may be propagated by the seeds, yet they are of such slow growth that they are apt to be overpowered by weeds, and the better mode is to plant small cuttings of the grass in the latter end of autumn: fine crops have indeed been obtained which were planted in the middle of December. The land should be drained as well as circumstances may permit; for although it suits a wet soil, and irrigated land, yet the water should not be suffered to rest upon it: the ground should then be well cleaned and pulverized, and the cuttings scattered over the surface, after which it should be very slightly covered with loose earth, or with peat ashes and earth well mixed. These cuttings are prepared in the simplest manner by twisting the strings into loose ropes about the thickness of the arm, and then cutting them with a hedge-bill upon a plank into lengths of about three inches and a half. When the crop comes up, it should be carefully weeded two or three times during the first year; after which there will be no occasion for a repetition of that process.*

We have thus inserted fiorin among the list of aquatic plants, for it certainly thrives best on very wet soils, bogs, and cold clays, or upon land that has been irrigated; and although it can be grown on sand and other poor soils, yet the crops are there very insignificant, and it requires not only a wet soil, but also a moist climate, to bring it to perfection. Its most valuable quality appears to be the green food which it produces throughout the winter; for, on land that is too heavy to admit of turnips, there can be no doubt that it may be rendered a valuable addition to the straw yard. On those peaty soils which abound throughout Scotland and Ireland, and the climate of the latter of which, as well as that of the west of Scotland, favors its production, it may also be considered very advantageous, especially if planted alone, unmixed with other grasses; but in other situations it is exposed to the objection of neither supplying spring-food, nor producing a second crop within the same year. Although succulent and palatable, and shown upon the authority of experiments on the fattening of cattle, stated by Mr. Aiton, to be capable of fatting a stot of upwards of thirty stone, in one hundred to one hundred and fifty days, according to the condition of the animal when put up, with less than fifty pounds of fiorin hay alone, without any other food;† yet this has been contradicted by other details,‡ and its cultivation has not been so generally diffused, even in those situations to which it is peculiarly appropriate, as the accounts originally given of it seemed to promise.

The choice of these aquatic plants must be regulated by the different degrees of moisture in the soil. On fens and morasses, if fiorin should not be chosen, perhaps there is none better, after a first drainage, than the water poa, which, by its spontaneous growth, will afford large crops, and at the same time allow the land time to settle. Such soils, however, consisting chiefly of decayed vegetable matter, require the aid of lime, or some alkaline substance, to bring it into action; after which they may be brought in the regular course of cultivation, to produce good permanent pasture. In situations not quite so wet, the flote fescue, flote fox-tails, and rough-stalked poa may be added; and on land still better drained, the following mixture has been recommended:—

Flote fox-tail,	4 quarts,
Flote fescue,	2 do.
Rough-stalked poa,	2 pecks,
Meadow fox-tail,	2 pecks,
Meadow fescue,	2 do.
Vernal grass,	2 quarts.

The latter, if the land be merely intended for pasture, may be omitted; but if meant for hay, should always be added.*

Winter Grasses.

On sheep-walks, or grass-farms, which are deficient in winter pasturage, Mr. Sinclair recommends the introduction of the following hardy and productive grasses, by the means which we have already stated of scarifying and top-dressing; namely—

Tall meadow-grass, and meadow fescue,	3 pecks.
The former only on very heavy land constantly fed by cattle; and on sandy soils, one or more of the hard-fescue, smooth-fescue, or creeping-fescue, should be substituted for both the above.	
Cock's-foot,	4 "
Timothy, if the soil be very cold and clayey; and on peaty soils, both species to be sown equally divided,	¾ "
Tall oat-grass,	2 "
Broad-leaved bent, or fiorin,	1 "
Woolly soft-grass, only in cases of considerable elevation and poverty of soil, when it may be substituted for fiorin; and the oat-grass may also be left out, making good the deficiency, however, by a proportionate increase in the other species.	
Pacey's perennial rye-grass	3 "
Burnet,	2 "
Perennial red clover, or cow-grass,	6 lbs.
White clover,	8 "

The quantities of the above have, however, been calculated according to the full complement requisite to form a new and complete pasture—only omitting the dwarf grasses, which are not necessary to be enumerated—but the proportion of

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other times with 16 lbs. of fiorin hay, and straw in like manner, was as 55¼ to 39⅜ ounces, from 6 gallons of milk; or 40 per cent. in favor of fiorin—Farm. Mag. vol. xxi. p. 59.

* See Tracts on Fiorin Grass, by the Rev. Dr. Richardson, and Davy's Agric. Chem. p. 366.

† Farmer's Magazine, vol. xvi. p. 53.

‡ See the Reports of the Counties of Antrim, part i., p. 250; Derby, vol. ii. p. 202; Stafford, p. 72; and Dumfries, p. 256.

* Comm. to the Board of Agric., vol. iii. p. 445. Antrim Rep., part. i. p. 249.

seeds which may be required to fill up the old sward with plants, must, of course, depend upon its deficiency in the different grasses: the full quantity of seed required for an acre, being about four bushels. The meadow fescue, and tall oat-like soft grass, and meadow cat's-tail, being, however, with the exception of fiorin, all plants of a later habit of growth than the others, and the greater part of them sending up a second, or a third growth of perfect herbage, sufficiently point out their superior value for winter keep.*

The state of vegetation throughout winter, depends much upon that of the atmosphere about the beginning of the season. If it commences with a sharp frost, unaccompanied with snow, it nips the late spring grasses, and blights all that have not attained maturity, so that they do not again resume their freshness. If it begin with immoderate rains and sleet, it so cools and washes the surface of the land, that a state of decay immediately commences. Mr. Sinclair has observed, that "when the average daily temperature has not materially exceeded 46° of Fahrenheit, the growth of pasture is, to all practical utility, stationary; and when the herbage that is produced under a low temperature, and at a season when the influence of the sun is weakest, is chemically examined, the saccharine and mucilaginous matters, particularly the former, are scarcely one-third so much as in the herbage produced in a temperature, when the sun is nearly at its highest degree." No kind of weather, however, prolongs the winter verdure more certainly than a steady frost, accompanied with snow; for in that dry state of the air, snow affords a protection to immature plants, which, under its cherishing cover, acquire somewhat more of solidity and ripeness.

Grass Land

Of every kind may also be improved, by merely combining the seeds with a top-dressing of compost, or by simply harrowing in the seeds at the proper season. The first method requires the smallest quantity of seeds, and they will be more productive during the first year; but by the latter, a greater extent of pasture may be sown, and at a less expense.

In the *first mode*, the top-dressing, before being applied, should be reduced to a finely divided state, and should, if possible, consist of such materials as will improve the texture of the surface-soil, as well as possess the essential principle of enriching it: thus one-half spit-dung and one-half sandy or light earth, partly road-scrapings, coal and wood ashes, scourings of ditches, and dry pond-mud, previously mixed with hot lime, and frequently turned during several months, have been used with success. The hot lime is, however, only to be used in the composts of ditch and pond-mud, in which it is absolutely necessary, in order to bring those substances into action. The compost being thus prepared, and in such a medium state between moisture and dryness as to crumble freely under the spade, is then in a fit condition to be mixed with the seeds; but this should be delayed until the day of sowing. They are best mixed with top-dressing by passing both at the same time through a coarse wire sieve; and, after a little practice, two men can prepare a large quantity in one day. It ought not to be less than ten cubic yards per acre.

The sward must be prepared for the reception of the seed by an ample harrowing, or coarse scarifying, so effectually performed as to bring the dressing into complete contact with the soil; and the operation, so far from injuring the old turf, will be found to benefit it. Rolling, however, unless the land be very light, is not necessary, and, if the ground be in a damp state, may be attended with mischief. The best season is any time in March, or early in April, according as the state of the weather and the nature of the soil admit of the most effective working of the harrows or scarifying. If, however, the pasture be laid up for hay, the older grasses will greatly injure, or perhaps overpower the seedlings; the proper course is, therefore, to pasture with young cattle stock, and to keep off sheep during the first year.

In the *second mode*, the grasses by which the turf is to be renovated, are, as we have already stated, introduced by merely scarifying the surface in the former manner, but to the full, if not greater extent; and it is equally essential, that all stagnant water be carried off by drainage. The seeds should, however, be furnished in rather larger proportion, because the powers of vegetation are lessened by the want of the top-dressing; but the time of effecting the operation should be in all respects, the same as in the first method.

"As every different soil produces grasses peculiar to itself, and as no other kinds can be established or cultivated upon it without first changing its nature to resemble that which produced those species which we wish to introduce, it becomes a point of the first importance in making experiments on different kinds of the numerous family of plants, and stating the results, to determine with sufficient accuracy the nature of the soil, or different soils employed, and to describe them accordingly." It may therefore be here almost unnecessary to repeat, "that the basis of every improvement in the cultivation of grasses is, to sow the seeds of those species only, which are adapted to the soil: or, to change the nature of unsuitable soils to that which is fitted for the growth of grasses deemed more desirable; and unless this point be in the first place ascertained, and fully attended to, disappointment, rather than success, may be expected to follow the labors of the farmer."* In this we entirely coincide with the respectable author whom we have just quoted; and we also admit the justice of another remark made by him,—"That agriculture has been much discouraged by the injudicious writings of those who invidiously hold up empirical practice as comprising everything to be desired, or sought after, as a guide in conducting the operations of husbandry, and at the same time by insinuations and affected sneers, endeavor to bring the service of scientific knowledge into contempt." Yet we must take leave to put our readers upon their guard against implicit confidence in the conclusions drawn by him and Sir Humphry Davy regarding the comparative nutritive powers of the grasses as detailed in their experiments; for they appear to us to have been made on far too minute a scale to admit of any just inference respecting their properties in the feeding of cattle. Although a chemical analysis may ascertain the respective proportions of nutriment which each apparently contains, we have yet to learn the effect of the digestive organs in extracting it from the different species; and nothing but experience should satisfy any one regarding their assumed value. We mean to say nothing disrespectful of chemistry, and we make no doubt the science will be gradually brought still more beneficially to the aid of agriculture; but it is a well known remark—that, when chemists dabble in husbandry, they are almost invariably found to be bad practical farmers.

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* Sinclair on the grasses best suited for pasture during winter. Prize Essay of the Highland Society, N. S., No. xx. See also Mr. William Hogg on winter pasturage, ibid., No. xxii.

* Sinclair's Hort. Gram. Woburn., p. 115.

Transplantation of Turf.

A plan was introduced about twenty years ago by Mr. John Blomfield, of Warham, an eminent farmer upon the estate of Mr. Coke, of Norfolk, of laying down land to pasture, by transplanting a portion of old turf in stripes or pieces, in the same manner as sods are usually laid for lawns, at certain distances from each other, leaving the other parts uncovered, whence they afterwards extend their roots, and become one united sward. The operation, as described by Mr. Blaikie,* from whom we have partly extracted it, commences in autumn, as soon as the turf, which is intended to be removed, is sufficiently moistened by the rains, so that it can be pared off clean, and without injury to the plants: or as soon as the farmer can spare his teams and laborers after harvest.

A clean, sweet old turf, of the best description, is then chosen, and cut with the common breast plough, or with any of the implements used in paring and burning,† into slips of about two inches and a half in thickness. These are also sometimes cross-cut with a scarifier, heavily weighted, so as to press the tines to a proper depth into the turf; or they are carried to the field intended to be laid down in large flags, then set in straight lines at regular distances, and chopped into pieces about three inches square, and placed in the manner hereafter stated.

A harrow, or a scarifier, with round or square tines, about an inch and a half in diameter, and set about seven inches and a half apart, or four times to the yard, is, however, first drawn regularly over the field at right angles; thus marking out the distances for placing the pieces of turf, and making an opening for their reception at those angles where the tracks of the times cross each other. Women and children are then employed to place the pieces with the grass side uppermost, and as they plant each separate piece, they press it into the ground with the foot; or, if any difficulty should occur through the hardness of the ground, a common wooden hand-rammer may be used. Particular attention is, however, requisite to this part of the process, for if the roots of the plants are left exposed to the weather, they will be materially injured. The whole process should, therefore, be executed with all possible expedition, especially when carried on towards winter; for, as frosts may occur at any time during that season, no more turf should be cut, carried, and spread in the day, than is likely to be laid before night; and no greater extent should at any time be undertaken than there is a probability of completing perfectly.

An acre of old turf, thus divided into squares of three inches, will plant nine acres of arable;* but although this is the most common, and generally considered the most proper size for the pieces, and the distances for their being set apart, yet if not convenient to spare so much old sward, they may with safety be placed still wider. It is also evident, that no part of the old meadow need be wholly destroyed, as narrow stripes of turf may be cut from it at such moderate distances as will insure the blank spaces being afterwards filled up with a fresh growth. It has, indeed, been found to improve rather than to injure sward which was previously hide-bound, or mossed, in the same manner it would as if scarified: it should, however, have a good top-dressing, be replenished with the seeds of those grasses in which it may be deficient, and be well rolled.

The expense of this mode of converting arable land to pasture has been stated by one of the claimants for a premium, offered by Mr. Coke, for the encouragement of this species of husbandry, to be about 2*l.* 9*s.* 3*d.* per acre, according to the following account.

Paring 1 a. 2 p. 18 f. of turf, at 10s. per acre,	£0	16	2
Carriage of 600 loads of turf, fifty days work for one horse, at 3s. per day,	7	10	0
Lads driving carts,	0	19	8
Scarifying 11 a. 15 p., at 2s. 6*d.* per acre,	1	7	9
Laborers filling, cutting, spreading, and planting the turf on ditto, at 30s. per acre,	16	12	10

It must, however, be observed, that there is no allowance made for the year's rent and taxes, or for the expenses incurred by the previous summer fallow of the arable land, nor any charge for restoring that from whence the turf was taken; the real cost should, therefore, be stated at considerably more. With the view, however, of lessening this outlay, some experiments were made at Holkham, under the immediate inspection of Mr. Coke, for the purpose of ascertaining whether crops of corn or pulse could not be sown at the same time as the transplantion of the turf, without injury to the future pasture. and in this we learn that he has partly succeeded. A piece of arable land, which had borne a crop of Swedish turnips, was ploughed, harrowed, and transplanted with turf in the month of March, and four bushels per acre of Poland oats were sown broadcast at the same time with some clover; the seed being scarified in before the turf was planted, and the whole afterwards lightly rolled. The result was, that the oats produced a crop which was estimated at six quarters per acre, and were reaped without injury to the young pasture, although the bottom was full of grass; but although quite covered with plants, yet fewer of them perfected and shed their seeds than in two other experiments, in which Heligoland beans were dibbled along with the turf.

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* On the Conversion of Arable Land into Pasture, 3d edition.

† For which see chapter xvi.

* Thus—"One acre cut into pieces of three inches square will produce 696,960 plants. One acre of arable marked out in squares of nine inches to the side of the square, or eighty-one square inches, and one plant to each square, will require 77,440 plants, each standing six inches apart, and occupying nine square inches of space."—p. 17. *One* acre of turf to *six* of arable is, however, a surer proportion.

From the Genesee Farmer.

ECONOMY IN FEEDING WITH HAY.

With many farmers it is considered sufficient that horses and cattle are fed with hay once, or at most twice in twenty-four hours; and they would probably object to the trouble and labor of feeding them more frequently. They ought, however, to reflect, that the injury which fodder sustains by the breath of the animal constantly blowing and condensing upon it, thus rendering it disagreeable and liable to be rejected and wasted, often occasions a loss, which greatly overbalances the trifling saving of labor and trouble. Some farmers think that there is no danger of animals suffering from hunger so long as there is plenty of hay before them: but if this hay has been lying a day under their breath, it will be found to have become so disagreeable and loathsome to them, that they cannot be made to eat it freely, without actually starving them to it. What farmer is there, who would be willing to eat a dish of food, the surface of which was covered with the gathered condensations of the breathing of twenty successive hours? Not many.

It ought, therefore, to be a rule with farmers, to give little hay at a time, and repeat it frequently, taking care at the same time that what was last given be consumed before any additional supply is offered. By this management, none of the fodder will be lost, and the animals will derive the advantages of having fresh and wholesome food, for which they will at all times have a good appetite.

There is another point of economy which is well worthy of attention. It is not an uncommon occurrence, particularly in wet seasons, and often in consequence of bad keeping, that a considerable quantity of hay is more or less injured, so that cattle do not eat it freely, and it is frequently thrown aside as *bad hay*. Now cattle may often be made to eat this readily, and without any injury to themselves, by wetting it with brine, which not only renders it agreeable to the taste, but also has a beneficial effect on the animals, particularly in winter, when salting is apt to be neglected. In performing this operation a quantity of brine no greater than is sufficient to render it moderately damp should be applied, or else it will be unpalatable. The same effect will be produced if the brine is too strong. It may be conveniently applied with a common watering-pot. In mild weather, a considerable quantity may be prepared at a time, by sprinkling successive layers of hay and leaving it in a heap, but it should not be allowed to ferment. The moisture thus becomes equally diffused through every part, and it is in a better state than when freshly brined. In the same way, *straw* may be rendered very palatable for cattle, generally quite as much so as common unsalted hay.

From the Southern Agriculturist.

SALT AS A MANURE FOR COTTON.

Mr. Editor.—Will you do me the favor to inform me, whether you have ever used salt as a manure for cotton?—if so, how is it used, and in what quantities? I have been for some years back using the salt-mud, and salt-marsh, with the greatest success; and every one who has tried them can testify to their excellence, as a check to too superabundant growth.

If you can answer my queries, Mr. Editor, or if you can get some of your correspondents to do so, you will confer a favor upon

ONE INTERESTED.

St. Andrew's Parish, Dec. 12, 1836.

Answer.

We have been giving the subject, about which "One Interested" inquires, the most diligent investigation; and we are happy that it is in our power to offer the desired information.

Common salt, as a manure for plants, has been long known to agriculturists in Europe, and in this country. Its properties are however, as a stimulant, and not as a nutritive manure. Count Chaptal, in his admirable work on "Chemistry applied to Agriculture," lays it down that, it is in this manner that salt always acts upon the plant; and the experience of every planter bears evidence to his position. What spices and pickles are to man, salt is to vegetables. It serves to increase the appetite of the plant, to invigorate its digestive organs, and to give a healthy tone to all of its functions of life. By combining with the aliments of the plant, and by carrying on an uniform decomposition, it gives a more regular supply of nutrition.

Acting, as salt does, purely as a stimulant, it should, consequently, be supplied only in suitable proportions. If it is supplied in too large quantities, it will be absorbed by the organs of the plants in such a manner as to produce irritation and dryness; and it is in this way, that the best soil is sometimes stricken with barreness.

But to the point in question—how much salt can be used without injury; and in what manner?

The Honorable Whitemarsh B. Seabrook, of Edisto Island, informs us, that for two or three years in succession, he tried the experiment with salt as manure for cotton. The salt he made use of was common rock-salt, well pounded up; and the land upon which it was applied, if we recollect aright, was of a light sandy nature. He applied it to the task row (105 feet) in quantities from one pint to one quart. The result was as follows: The row manured with one pint of salt produced excellent cotton, which from its germination to its maturity, assumed a healthy and vigorous appearance. The cotton bore well, and its staple was strong, and the seed well covered with wool. Wherever a larger amount than one pint was applied, the plant went through the process we have supposed in our general remarks. It grew luxuriantly at first; but, before maturity, it became dry, and seemed gradually to die away with thirst.

As nearly as we can recollect, it was the opinion of Mr. Seabrook, that unless the soil was naturally good, it was best to apply the salt mixe with compost or stable manure. This agrees with the practice laid down by Chaptal and others. Indeed salt, like all other stimulating manures, must have something to act upon. To assume the comparison which we have already used, like the human appetite after being excited by spices, it must have good wholesome food to nourish it.

In addition to the information afforded by Mr. Seabrook, several gentlemen on Edisto Island have made similar experiments, with the same success. Though few of them have applied salt in its unmixed state, they have, most of them, applied it when mixed with compost and other nutritive manures. As to its effects, all seem to agree, that it acts beneficially upon plants; and more so, perhaps, upon the cotton plant than upon any other.

That it has a direct tendency in producing fine cottons, is abundantly testified by circumstances within the observation of every one who knows anything of that plant. We must all acknowledge, that, the farther removed from the salts the soils is, upon which the cotton grows, the more it deteriorates in quality. Dr. Ure, of England, who has written an interesting work on the cotton manufacture, and on the natural history and husbandry of the plant, once made an experiment upon two parcels of cotton, to see what quantity of salt they each contained. The first was upon 5 lbs. of very fine sea-island cotton, which had brought 6s. in Liverpool: the other was from 5 lbs. of a coarser cotton of the same sort, which brought only 4s. Both of these were burnt, and the salt separated from the ashes of each. We have not the exact result of the experiment before us; but we recollect, that, the ashes of the fine cotton contained a much larger proportion of salt than that of the coarser. From this experiment, and similar others, Dr. Ure was persuaded, that a due proportion of salt entering into the plant, always improved the staple of the cotton.

If these facts be correct, and no one can doubt them, does it not behoove our planters to give the thing a trial? Salt can be readily purchased, at 50 cents per bushel; and if the sweepings of the cellar are purchased, it can be had for much less. At the rate of 1 pint per task-row, 10 quarts and a half (allowing 21 rows to the task) will manure the task, and a little more than a bushel and a third will manure an entire acre. Let our planters consider this matter well; and let them make the experiment.

Before concluding, we would mention one other practical instance of salt having been applied with success to cotton. The late Wm. Edings of Edisto Island, from a barrel filled with sea-water, watered a portion of his field, after listing in the land. The water was poured upon the list, so as to saturate it moderately. The cotton grew well and bore well; and he often assured us, that nothing prevented his making a general practice of the experiment, but the want of proper carts to carry the water. We mention this experiment, not that we would advise its adoption, but only to add another proof of the beneficial effects of salt when applied as a manure. When we take into consideration the small expense of this manner, the ease with which it may be applied to the land, and its undoubted beneficial results, we predict that its general adoption will produce the same effects upon the agricultural interests of this state, that the introduction of calcareous manures have done for Virginia.

EDITOR OF S. A.

From the Memoirs of the Philadelphia Agric. Society.

ON RECLAIMING MARSH LAND.

By R. G. Johnson.

Salem, N. J., Feb. 10, 1819.

Sir—Being disposed to submit my observations and experience in practical agriculture, for a period of twenty-eight years past, to the perusal of the readers of the "Memoirs of the Philadelphia Society for promoting Agriculture," I shall be sufficiently gratified should any thing be gleaned from what I have written, which may tend to throw some light upon a subject connected with rural economy, and which in some parts of our country, is but imperfectly understood; I mean the reclaiming and bring into a dry and profitable state, the numerous wild marshes, which line our bay, river, and creeks.

The wild marshes are made from the sediment carried on them by the flowing of the tides, and deposited among the different species of wild grass, which every season spring up, and in the autumn decay, and then become incorporated with the sediment of the preceding year, mixing with the various putrescent animal and vegetable substances of which the quagmire is composed. From this mass is produced a soil, which, when brought into good cultivation, continues its extraordinary fertility for many years. I have observed, that on such marshes, the line of distinction may be easily traced by the effects of the salt, and the brackish water, upon the numerous species of aquatic plants which grow thereon. As far up the Delaware as Reedy Island, grow two species of salt grass—the rosemary salt-sedge, and the red salt-sedge, and two species of reeds; from thence, to about the mouth of the Christiana Creek, or Deepwater Point, grow the three square, the two kinds of reeds, and fresh rosemary; and from thence up the river, (the water being fresh,) grow the bull rush, three square, only one kind of reed, wild oats, flags or cat-tails, fox-tail, spatter dock, and the water lily. For bringing into cultivation such unproductive marshes, the universal practice throughout our country (until a few years ago,) was, to dig a ditch parallel, and about six feet distant from the footing of the intended bank, and from that to make a bank of such form and size as accorded with the judgment of the owner. After the bank had stood a year or two, it became apparent that it had not only settled, but that the foundation had inclined towards the large ditch. To keep up the bank to its proper height, it was then thought necessary to dig a ditch about ten or twelve feet in the inside, and pack that on the bank; but even this method did not permanently remedy the defect. The evil of such proceedings was apparent, because the foundation could never be made sufficiently firm to support so great a quantity of mud, without settling so low as to admit the tide overflowing the same, unless frequent additions of fresh mud from time to time were made to keep it up to its former height; and even then the expense and difficulty have been increased, in consequence of the scarcity of mud, both within and outside of the bank, and of the great pressure of mud forcing the foundation into the ditches. Another very serious evil was, that these ditches afforded an easy and safe passage for the muskrats and fidlers to enter at all parts of the bank, and thus admit the water, so as frequently to break it.

Tide Bank.

In the present improved method of reclaiming wild marsh from the tide, the first thing to be done is, to stake out the site for the intended bank, at such a suitable distance from the margin of the river or creek (as the case may be,) as to allow a sufficient space for a guard against the swells of the water in stormy weather, and for the preparation of mud to make and keep in repair, at a distance not near than four rods from said bank. Should the marsh be composed of a mat of sedges or reed-roots, (as a preparation for the intended bank,) the laborers should remove one spit deep of the roots, and lay them aside to be packed on the bank when nearly finished.

The trenches from whence the mud is to be taken, are to be served in the same manner, because such hard sods can never be sufficiently packed, but that they will admit the water. The surface being now removed, they will proceed to cut and wheel the good mud into the bed designed for the bank. To do this properly, it will be necessary that the laborers should be apportioned to the different parts of the intended bank in separate gangs, as the work will then be carried on to the best advantage, not only to themselves, but their employers. A gang is composed of five hands, two to cut and load the wheelbarrows with mud, two to wheel it to the bank, and one to be there stationary as a packer. The business of a packer is to lay out the bank, pack every sod of mud that is delivered to him by the wheelers, and attend strictly to the carrying up the bank, in its true proportion and proper height; he is also to assist in making the gangways to run the wheelbarrows on. As to the size of the bank, the owner must be governed entirely by circumstances; if his marsh is situated upon a water subject to freshets, which swell the tides beyond their ordinary level, or, is of a spongy or miry bottom or, if lying on a losing shore, or subject to be beaten on by particular stormy winds, which raise the tides; in any of these cases he must build and fortify his bank accordingly; but if free from those liabilities, and his marsh high and of a firm blue mud stratum, in that case, I should suppose a bank of twelve feet base by six feet in height, would be sufficient: but I would observe, that I have never seen a bank too large. Let the bank be of what size the owner may choose, I have always considered that the base should be double the width to the height, and as to the sides or slope, they should be at or about an angle of fifty degrees, and the breadth at the top of the bank about one sixth of the base. To wheel mud on a miry marsh, it is necessary the men should have boards to lay upon the mud, but in wheeling their barrows to the top of the bank (which would be an elevation of six feet,) they must have plank of not less than thirty feet long, though the longer they are the better, provided the men can handle them, and they should be not less than four inches thick. To support the plank in the middle, they should have several light posts with holes morticed in them, through which a rail or pole is temporarily inserted, so as to bear it with the weight of mud passing over, and also to prevent it from swagging; these posts will be removed, and the wheeling or gang-plank, as it is called, must be removed several times before the laborers complete a single rod.

Sluice.

The bank being finished, a suitable place must be selected for laying a sluice, which should be several rods distant from the creek or river, into which it is to discharge the water from the marsh. In the preparation for the intended bed of the sluice, the water course should be begun from the margin of the river or creek, and its depth continued at about the ordinary low-water mark, until the bed of the sluice is cleared, when the digging should be suspended until the sluice is bedded and finished. The mud on each side of the intended bed should be removed a reasonable distance, lest, when piling for the sluice, any sudden jar might cause the sides to cave in, and thus fill up the bed. After the bed is dug, four stakes, having lines fastened to them, are to be drawn taught, and stuck into the mud exactly on the bottom, where the sluice is to be laid, but within the breadth of the sluice by about two inches; for example, should the sluice be four feet wide, then set down those stakes at the distance of three feet nine or ten inches apart. In the mean time some person should be in readiness with the pilings. These pilings are made from inch boards (no matter of what wood, for in the mud they never rot,) sawed off, to the length of about three feet, and are to be sharpened; this is done by a person cutting and sloping away both sides of one end of the board alike, and by cutting off three or four inches of one of the corners, at an angle of about forty degrees. These pilings being set by the lines, are driven down to a level with the bottom by a maul or tip, beginning at one end, and so proceeding on, until both sides are completed, and by crossing the bed in several places and immediately under the in and out end of the sluice, always rememembering that the piling be put down with that edge having the point cut off furthest from the board last driven; so that in forcing it down, by the time it will be brought to a level with the one preceding, it will be drawn perfectly tight against it. Should the sluice be made of two or three funnels or divisions, you must drive as many rows of pilings as there are divisions of plank. If the mud is good where the sluice is laid, by piling in this manner, it can never settle, and no muskrat or mink, can ever undermine it. The piling lengthways and across being completed, and the lines removed, four poles eight or ten feet long, are to be set down by the four corners of the pilings as marks to direct the workmen to the exact place into which they are to float the sluice, and excite their attention to those parts as it settles on the ebbing of the tide. When the sluice shall have grounded on the pilings, one of the workmen is to examine if it has rightly bedded, and if so, they will then proceed and cover it up with the best mud, care being now taken that a trusty packer be stationed there, to pack every spit of mud as it is delivered to him. It will now be necessary to lay two logs across and resting upon the front and in-ends of the sluice, with their ends bedded in the solid marsh, so as to prevent the mud as it is packed on the sluice from slipping out, and to prevent muskrats and other vermin from burrowing at or near its sides. It will also be necessary to have inch boards sawed to about six or eight feet in length, to be pointed and sharpened in the same manner as directed for the pilings. The laborer standing sideways to the log, with his face towards the sluice, must set the edge of the board against the sluice and perpendicularly against the log with the cut off corner of the board next to himself; two other men must have a two inch plank in readiness, and while one of the ends rests on the mud, the other is placed by the man attending the piling, on the top of it, who are to hold it steady while the two men walk on the plank until they come over the piling, when, by raising and sinking themselves, they force it down with great facility. This method is continued until these logs are piled from end to end. It must now be obvious even to a person unacquainted with such business, that if a sluice be laid and secured in this manner, nothing can injure it. For three feet under low water mark, it cannot be unmined, being, as it were, a tight board fence, and for more than half-tide up, an equally impenetrable barrier against any kind of vermin.

The duration of a sluice of good materials, and well laid, may reasonably be computed at thirty years. From my own observation, I am decidedly of opinion, that sluices should always be preferred to flood gates. My objections to a flood gate are, 1st. Because the cost is more than double that of a sluice. 2d. A flood gate, on the average, will not last more than from ten to twelve years; while a sluice will last from twenty to thirty years. 3d. A flood gate is frequently out of repair; from the construction of a sluice, it can seldom want any thing done to it, and when necessary, it is easily repaired. 4th. Should a muskrat work a hole under the flood gates, and they blow out, they are good for nothing. Should a sluice blow out we have only to make a counter dam, and relay it on the same bed, or dig another close to the one on which it before rested, and there lay it. The sluice is just as good as before the blow out. These are my reasons for giving the preference to the sluice.

Description of a Sluice.

A sluice is a trunk on an enlarged scale, for the constructing of which the usual way among farmers is to cut down a large tree, and by reducing its sides to the thickness of from ten to twelve inches, it is hoisted up, and slit through by a whip-saw, which forms the two side planks for the sluice, each being about eighteen or twenty inches broad, and in length from thirty-five to forty-five feet. These planks are then set up the width intended for the sluice, (usually about four feet,) and covered over with good two-inch plank, well secured with inch wooden pins. The door is made of two-inch plank also, and hung within these side-planks about six feet from the mouth. The method of hanging the door is, by pinning two pieces of scantling, three by five or six inches, to it; and a like piece upon the top of the sluice over the side plank, and through these four pieces of scantling to bore a two-inch hole, through which is passed a good wooden pin or iron bolt, to hold the door securely, and permit it to open and shut easily. The advantage of hanging the door a little within the sluice, is to prevent its being injured by the ice, or by pieces of floating timber, and by admitting the discharge of the water more freely from it; for in leaving the sluice it glides away in a smooth current; whereas, if the door was hung at the mouth, the water would pitch down and wear a deep hole immediately on its leaving the mouth. If it should be thought necessary to have a large sluice, say six, eight, or ten feet wide, the division plank must be increased to the number of intended funnels: thus, if there are to be three funnels, then there must be two division planks, and so on.

Flood Gate.

Tho flood gate is constructed of sills, ties, caps, posts, and studs, all morticed and tenanted into each other, in the same manner as any ordinary frame building, by having its bottom planked tight, and its sides boarded up, with its door or doors hung to the posts, in the same manner as a common stable door. Now it must be obvious to any person, that so much wood work, exposed to the alternate operation of wet and dry, must, in a few years, give way; while the sluice which has been well laid, and is never dry, will, of course, resist the effects of decay for very many years.

Creeks and Dams.

It sometimes happens in large tracts of marsh about to be reclaimed, that there are creeks of considerable width and depth, with a strong tide setting through them, and although the sluices may have been laid, and the bank completed, and that too at a very considerable expense; yet, until they be safely dammed out, nothing can be said to have been done effectually. No business in the whole circle of agricultural science, appears to me to be of more importance, than a knowledge of the mode of constructing a perfect dam of magnitude upon a mud bottom, over a deep and rapid creek of tide water. The method which I have found to be the best, I will take the liberty of recommending to others. In the first place, I proceed with a hand or two in a boat at low tide, and carefully measure, and note down the depth of water at every eight or ten feet, until I have ascertained the exact depth from shore to shore, as well as the distance across. Then all necessary timber is provided, and worked so as to suit the different purposes for which it is designed; all such posts and other timber as may be wanted for a day's work are put on board of a large scow, or other vessel capable of the service. Having proceeded to the site intended for the dam, stakes are to be set up on both sides of the creek, the tops of which must be at least two feet above the intended summit of the bank when finished. With sheer-poles and tackle, we proceed to set down a post by lowering it into the mud, and then forcing it down to its proper depth, either by a man hoy, as it is called (being a large block of wood,) worked by hand by the men; or if that be not convenient, by having a large log chained with one end to the top of the post, and the other end resting on the boat, and by the assistance of half a dozen men, jolting up and down on it, the post is soon driven home; another is then set down opposite the last, and when done, they are secured to each other by a large piece of timber called a cap, morticed to suit the tenons of these posts, and raised up and put on them. Thus the labor of setting, driving, and capping these posts is continued until these two rows are completed. After that, a single row of long slim logs, (I have used many from fifty to seventy feet in length,) are to be bolted to the inside of these posts, so near low water mark as the work can be performed. And here I would observe, that all pieces of large timber used in the construction of the dam, and which cross the current, or run parallel with the dam, are called ties. All pieces of timber that cross the dam and rest on the posts, are called caps. All pieces of large timber driven into the mud, and connected by caps, are called posts. All small timber that a man can handle, such as poles, boards or plank, which are forced down by the weight of men into the mud to secure it from slipping, are called pilings. The long ties being bolted to the posts, prevent them rocking about by the rapidity of the current; and they are also the main support to the tops of the pilings which rest against them, and confine the mud to its proper place. Another set of posts, much shorter and lighter than the former, are driven midway in the space between the large posts, and pressed hard against and inside of the long ties. Opposite to these, and furthest from the long posts, other short and light posts are driven down and capped, on a range with the surface of the marsh. These outside posts are secured by a single row of long ties bolted to them; a second row of long ties are then put on the inside of the large or middle rows of posts, and directly over the in-ends of the caps of the outer posts, forming for these two middle rows of posts two complete rows of long ties, which are bolted to the large posts, and the in-rows of small posts are bolted to these long ties. Thus there will be three distinct apartments or spaces for the mud, and four separate rows of pilings to secure it within, so as to receive the body of the dam to its proper height in the middle apartment or space between the high posts, while the two outer spaces are to be considered as supports or footings to the whole; so that by packing the hardest mud in these outer spaces against the pilings of the inner rows it is apparent that the whole pressure of the weight of mud will be directly downward; nor can the body of mud incline either to the right or left of these middle rows of pilings, because a like quantity of mud being thrown into each of the outside spaces, will produce a like pressure upon the centre of the dam. For these pilings I would prefer two-inch plank, sawed to suit the varying depths of the water, because they are more easily pointed and more quickly driven to their proper places by three men using a plank, as prescribed in laying down the sluice. In filling up these spaces, (particularly the middle one,) it will be necessary to observe that no more work is to be laid off for the day than can be secured and completed, so that it may not be swept away by the current at night. In doing this, no greater distance along these four rows of ties should be piled than can be filled up by the hands during the day; and as preparatory to filling up the day's work, three light ties or sticks of timber, about six inches in diameter, and of length sufficient to reach across each of the three spaces, should be laid across the long ties and rested for support against the posts. Within and against these moveable ties, good plank should be stuck down close to each other, and as much mud should be thrown within, as would support them firmly to their places, and enable them to resist the impetuosity of the tide. Without these precautions, the rapidity of the current would carry away the mud as fast as it was thrown in. This process, called cribbing, is necessary to be repeated at every lay-off of the work. From these cribbings, in the middle space, the mud is to be sloped backward, towards the top of the bank that had been previously finished; and before these cribbing planks can be safely removed, there must be another set of cribbing planks put down, and the four rows of long ties piled all in the same manner as the former. Thus we continue to draw up these cribbings next to the bank, and advance the new cribbings as the work progresses, until the breach be completed. To accomplish such work to the best advantage, substantial wheeling plank should be laid over the middle row of caps, for the men to run their barrows on in safety; and when it is necessary to bring their mud from a greater distance than about eighty feet, another gangway should be formed, that all the loaders (or, as they are sometimes called, shovelmen,) may be kept constantly at work. There should be two sets of wheelers for one set of shovelmen; one set of the former to wheel up the mud half way to the dam, and there to meet the other set returning with their empty barrows. At this place they exchange their barrows; those who came up loaded, return with their empty barrows to be again filled, while the others, turning about, proceed to discarge their loads in the breach. That all parts of the work might advance aright, there should also be two large flat-bottom boats, (scows,) which could be very advantageoutsly employed; the one within the dam in the creek, and the other on the outside, with hands sufficient to work them. Their business should be to bring mud from the sides of the creek, and discharge their loads into the two outer spaces, viz. the footings, by throwing the mud with force against the pilings of the two inner rows. During all the time that the laborers are employed, a few trusty men should be stationed in the mud at the dam, and should be ordered to pack every wheelbarrow load as it is delivered. Should the mud happen to be soft and inclined to slip, it will then be necessary to spread over it occasionally very thin layers of fine brush, or, what is equally, proper, three-square young reeds, or any long grass. Alternate layers of such materials being incorporated with the soft mud, give it such tenacity, as that the workmen can carry up the dam to its proper height and shape. The width of such a dam would be from thirty to thirty-four feet, and the work when completed would exhibit a view, from the edge of the water at low tide to the top of the bank, a slope at or about an angle of fifty degrees. Before the work of filling up the breach is fairly entered upon, I consider it safest to guard the opposite side by running off a crib, some ten or twenty feet, and securing it by good mud packed within; for as the work advances and the width of the breach lessens, so in the same proportion, will the rapidity of the current increase. As the work advances, it would be advisable always to let the sluice doors be open to admit the tide into the marsh, and to keep up a pressure on both sides of the dam as nearly equal as possible.

Ditches.

The marsh being perfectly enclosed, and the tide excluded, it is now necessary to have it divided into lots of such size as may be most easily put into and kept in a dry and improveable state. In whatever number of acres the owner may choose to have his lots, they should be so laid off, as that the ditches dividing them should run perpendicularly from the bank towards the centre of the marsh and be not more than from twenty to thirty roods distance from each other in good mud; but where the mud is of a light fibrous texture, (such as is vulgarly called horse dung, or peat,) the ditches should not be more than twelve roods apart. The reason I would assign for such a division is this, that in irrigating such grounds the water can pass with facility along the ditches, and spread its fertilizing qualities through all parts of the meadows; and also by such distribution, the lowest and the poorest parts would receive the greatest proportion of the sediment. Another reason, I even assign, is, that the drier your meadow and better the mud, the finer and more nutritious will be the quality of the grass. It is invariably the case, that you will find the loose or peaty soil in the lowest parts of all marshes, and although it may sometimes produce a tolerable quantity of coarse herbage, or, by good cultivation, a prolific crop of the improved grasses—still none of those productions will be half equal in nutrition, to that grown on good mud. In the divisions of the marsh, let all the ditches be cut eight feet wide by three feet deep; a narrow ditch would be unsafe for the cattle.

Seeding of Meadows.

As soon as possible after the marsh has been enclosed, and while the ditches are cutting, set to work in good earnest to have your grass seed sown. It is all important to have it sown as speedily as practicable. Often have I seen the good effects of early and expeditious seeding of a new marsh, and frequently have I known that a delay for a year or two, has cost a length of time and labor to put in the seed, and even then to very little purpose. Should the marsh have on it a great quantity of wild herbage, no matter, be not dismayed: sow among them, throw on the seed plentifully, and you will in a year or two see your account in it. If any part should remain not seeded when the winter sets in, you may burn off the rubbish, (if you think best,) and commence sowing your seed in February; and that it may be evenly scattered over the surface of the marsh, sow the lots twice, by crossing the first with the second sowing. The roller is always to be preferred for the purpose of beating down the rubbish, rather than destroy it by burning. It is the practice here to sow the grass seed among the reeds, flags and wild oats, disregarding their height. I have been credibly informed a man a few miles from me sowed timothy among a most extraordinary growth of such plants, and who, when the seeding was finished, took a common gate (not having a roller,) and dragged it over the rubbish until it was flattened down; the rubbish soon rotted upon the moist surface, and afforded an abundant nutriment for the tender sets; the consequence was an extraordinary crop of grass the following year.

I would wish to be distinctly understood, that the seed should be sown on the marsh, while it is yet in its wet state, and before the frost of winter, or heat of summer, should either pulverize or dry the surface; for both these natural causes operating on the surface after the seed has been sown, will do more for the embroy seed just springing into existence, than (in large bodies of marsh,) hundreds, nay, I might say, thousands of dollars worth of labor could effect. After the seed shall have been sown, (and from long experience I can assert,) that the best and only sure way of speedily getting your meadow into grass, is to pasture it, as severely as possible, for the first and even second year. The wild herbage being kept down by the number of cattle continually feeding thereon, will afford the tender grass an opportunity to take root; while at the same time their continued trending of the soil, tends to bury the seed among the loose and decaying rubbish, and to render the surface more compact; for on that depends the growth of the artificial grasses, and the destruction at the same time of the wild plants. I consider as the truth, that the mellower a marsh is made, the less liable are grass seeds to take root, (although directly the reverse is the case in upland,) or, if they should happen to take root, they might vegetate for a while; but, when the heat and droughts come on, they will most assuredly perish.

Different marsh soils require different kinds of seed. The firm blue mud is best adapted for green grass, timothy and the clovers, particularly the white. The light spongy marsh (called horse dung or peat,) is fitted for none other than the herdgrass. Immediately after the bank is completed, this kind of soil should be sown with herdgrass, while it is yet new and in its wet state, and before it has time even to exhibit dryness on the surface. While it is yet wet, a sward of herdgrass may be formed upon it, and by pasturing it closely for some time, it will then be useful for mowing for many years. I would never recommend the sowing of herdgrass on good mud, because the timothy, clovers and green grass, are all far preferable, much more nutritious, and bear pasturing until quite late; on the contrary, the herdgrass is not so good for pasture, nor will it resist the effects of a late frost in the spring. nor an early one in the fall. Besides, it has a wonderful tendency to root out all the other grasses, with its innumerable long and very fine roots, and from the production of such an immense quantity of seed, which are so easily shattered out and wafted by the wind every where; that should but a very small portion of the seed be mixed with the other grasses and sown on blue mud, it would be discovered in a very few years, that the herdgrass had obtained the complete ascendancy. The herdgrass is admirably adapted for the salt marshes. It is wonderful how easily it can become the companion of even the red salt grass; and in proportion as it acquires strength and root, so in the same proportion does it take the place of that natural proprietor of the saline soil. When I speak of salt marshes, I wish to be understood, those marshes which are considerably brackish, but not so much as those bordering on the ocean. It is asked, what method should a farmer adopt, so as to render a light peaty meadow more compact? I answer, the only probable and sure way would be, to fodder his cattle throughout the winter on it: for their treading would have a tendency to consolidate the surface, and to cause a much thicker growth of young grass the following spring. It may appear incredible to those persons who are strangers to this kind of marsh, when I tell them that a mass of such peat or horse dung mud, as large as a hogshead or wagon body, exposed for a few weeks in summer to the sun and winds, would take fire as soon as it was applied; or if thrown into water, would float as light as a cork; yet, extraordinary as it may appear, (if proper care be taken to get a sward of herdgrass upon it,) it would astonish the beholder to view the abundant crop. The innumerable roots of the herdgrass, while they obstruct the rays of the sun, and the winds from penetrating the surface, at the same time shut in and retain the moisture for their own benefit; yet, if cultivation in proper time should be neglected, this kind of marsh will finally become so very light and porous, that a man in attempting to walk over it would sink to the depth of his ancles. Am I asked by what method are meadows to be continued improveable, so that they may be rendered capable of yielding considerable quantities of grass by the ordinary resources of any practical farmer, and that in the most easy and least expensive way? I answer, by *irrigation* in three ways: 1st. Partial. 2d. Effectual. 3d. Internal.

Of Partial Irrigation.

When meadows have been some time in bank, it is always to be presumed that a considerable portion of them have been brought into good grass, and that even the very high parts may have become too compact, or (as it is called by the farmers,) bound, to yield that productive burden which might be expected from them; wherefore, that the surface of the meadow might again be vivified, or, as it were, brought to life, from that dead state in which it is commonly said to be, when bound, recourse should be had to irrigation. It is a common practice with some of our farmers to let the water on their meadows about New Year's day, and so continue it until the vegetation shows itself in the spring, and when drawn off the surface, they often have the appearance of a beautiful green wheat field. Preparatory to irrigating, the sluices should have doors hung to their ends, so as to admit the tide, and, by shutting down, to prevent it from running out again. There should also be a number of trunks made from two to three feet square, and a few feet longer than the width of the bank; the number of these trunks should be in proportion to the number of acres to be irrigated, say one to about thirty acres. These trunks are laid in the tide bank opposite the highest parts of the meadow, and on a level with its surface, so that every flood might pass into it from the different parts of the bank at one and the same time, through these trunks and sluices; and on every ebbing of the tide might leave its sediment incorporated with the dead and decaying vegetables of the surface, which, by its daily increasing in quantity, augments its weight upon the falling rubbish, and with it affords the richest nutriment to the expected crop of grass. That a farmer might have the benefit of the early crop of good grass, such as timothy or green grass, which might be cut in all the month of June, and also improve the more inferior parts of his meadow by sowing grass seed on such parts as had not taken, he could, on or about the first of July, let the tide on them by the above method, and continue the process until the first of April following. He would then find, that where the rubbish had grown in the greatest quantity, and been beaten down by various causes operating on it, there the sediment (becoming incorporated with it,) had formed a new soil three or four inches in depth completely adapted for the reception of grass seeds.

This would be the proper time for the farmer to profit by his former mistakes, (in delaying to sow his marsh when first reclaimed,) by immediately drawing off the water, and casting his seed with a liberal hand upon the slimy surface of this new formed stratum, composed of putrefied vegetables and mud; nor let him forget, as the vegetation advances, that, for insuring a good crop of valuable grass, he must have a stock of cattle, the number of which ought to be in proportion to his acres, so as to keep down the superfluous growth of the wild plants.

Effectual Irrigation, or Drowning the Marsh, as it is called.

After a meadow has been many years in bank, the fine grasses almost all gone, and the surface generally covered with a coarse vegetation scarcely eatable, composed of weeds, rushes, bogs, &c., the farmer then thinks it time to let down the marsh, and drown it. This method is performed by cutting away the bank opposite the ditches, and by removing the mud from off the sluices; thus, the water having a free course through all the ditches, circulates the sediment equally over all parts of the marsh. A period of from five to seven years is considered necessary to produce the desired effect. Within this time there will have formed on the surface of the marsh (on an average,) a stratum of virgin mud, of from eight to twelve inches in depth. Should the marsh be permitted to lie down for eighteen or twenty years, it will then have collected a new stratum of from twelve to twenty-eight inches in thickness. After that length of time, there cannot be perceived any additional accumulation of mud, because the flow of the common tides will be no higher than about on a level with the surface; and I think it would be a certain loss to any farmer to let his marsh continue in its wild state after it had been down for even ten years, for the accumulation of the mud would in no way compensate for the loss of the difference of time, in which profit might have been derived from it in the ordinary manner of mowing and grazing. The first time that wild marsh may have been reclaimed, has never been considered so valuable nor profitable, nor will it so readily receive or retain that system of improvement, as a meadow which had been some years previously in bank, and turned down and drowned, and the second time reclaimed and cultivated.

I must here remark, that it is in a great measure owing to practical knowledge in agricultural science (in which some of my neighboring farmers have displayed their talents in the judicious management of their meadows,) that their veal has deservedly acquired the applause of the citizens of Philadelphia; and the markets of New York, as well as Philadelphia, will warrant me in saying, that the beef sent from Salem county has never been excelled by that supplied from any other part of the United States; and I have the vanity to believe, that even the best farmers in England have not exceeded us.

Internal Irrigation.

I can say but little of the salt marshes lying near the sea coast, and which had been periodically covered by the water of the ocean previously to their being reclaimed. There is an opinion generally prevalent, that a certain portion of salt is beneficial to grain and grass: may not too great a quantity of it be also prejudicial? I have often used the pickle from my meat tubs, and with complete success, in the destruction of the St. John's wort, and ranstead, or snap-dragon, where they have occasionally appeared on my land. And I am inclined to believe that all perfectly salt marshes, after having been in bank for several years, (and when the native vegetation of the soil has died,) become almost a barren waste, and when exposed to the penetrating rays of the sun, their saline particles are extracted for some inches in depth, so that distinct particles of almost pure salt may be seen on the surface. Indeed, I have seen the salt in such profusion when passing over the marsh, that my shoes would be as white as if walking in a thick hoar frost, and I cannot believe that any soil so highly impregnated with salt can be rendered profitable, for a series of years, in either grain or grass. As I know that some experiments are making to reclaim this highly saturated and almost useless kind of property, I will herewith submit my opinion as to the best mode of preparing this kind of real estate, whereby the owner may calculate on deriving more certain profit from it than is generally received.

So far as I have had opportunities of observing, I have generally seen springs of good fresh water issuing from the uplands and woods, and by the time they have united their numerous rills, they will have formed a creek of considerable size and depth, which, in meandering through the marsh, is discharged into the larger creek or river through the sluices or flood gates. Now nothing appears to me more rational to be done, than that the farmer should make a right application of this fresh water; which to one thus situated, I consider of the greatest importance. To freshen this reclaimed marsh, so as to make it just brackish enough to produce all the improved kind of grasses, he has nothing more to do than to shut down his inside doors to his sluices or flood gates, and hold the water until it shall have raised in height, so as to cover the surface of the whole marsh: his trunks lying in the bank (as before described,) will then vent all the superfluous water. Let this be done in the fall, and be continued until the following spring, then the water might be drawn off, and grain or grass sown, as suited the fancy of the owner. I have no doubt that in repeating this process for two seasons, the marsh will freshen exceedingly, and otherwise be materially improved. I would also suggest, that throughout the summer, the sluices or flood gates should be attended to, by having boards slid in them; and in the mouths of the ditches, pieces of plank should be set edgeways, so as to keep in all the ditches a certain and continued supply for the cattle, and different kinds of grain and grass which may have been committed to the soil. The height of the water in the ditches can easily be regulated by the number of planks to be put down, the one over the other. Another great advantage to be derived from this process would be, as I have before said, that the weight of water lying for several months on this peaty and light marsh, would tend to compress and render it much more susceptible of receiving the seed to advantage when sown on it.

Grain in Meadows.

I cannot say any thing in favor of the different kinds of grain, either from my own cultivation or that of my neighbors. I have known good crops of wheat, rye, corn and oats produced; but yet I have considered the cultivation of grain generally in meadows, as much too precarious for profitable culture. You may sometimes have a beautiful and strong standing crop of wheat or rye on the good blue mud along the bank, or edges of the creek or guts; but it would be no more than a mere slip, with here and there a patch, compared to the residue of the marsh; all the other parts will be nothing but weeds and rubbish. I also consider it a certain waste of time, labor and money, in endeavoring to derive a profit from sowing any kind of grain on the peaty or horse-dung soil; it may vegetate for a while, and produce a show of some straw, but very little, if any grain. I admit that grain has sometimes succeeded on the good blue mud soil, but when you take into consideration that all kinds of grain are uncertain in marsh grounds, and also the hosts of enemies of different tribes which will prey upon it, such as grubworms, mice, and birds without number; and moreover the grasshoppers and cockroaches which attack the grain after it has been reaped, and while in shock, you may readily conclude that the risk of the destruction would be much more probable than a fair calculation for profit.

My judgment, therefore, is, (calculating for a series of years, say six or seven,) that the loss would by far overbalance the profit. In my agricultural pursuits in early life, I was led to believe that the marsh was the very quintessence of nutriment for all plants, and that all kinds of grain might be cultivated there in great perfection. I tried different kinds of grain, and succeeded in causing them to grow; but, I remember, not to my satisfaction. I have long been satisfied in my own mind, that the upland was by nature intended for the production both of grain and grass, but that the marshes were designed for grasses only. There can be nothing more true in agricultural science, (according to my estimation,) than that a plough should never enter a marsh soil; we may be assured that the best side of any marsh is uppermost.

I have herein endeavored to give you my practical observations and opinions in answer to a part of the twelfth inquiry, as stated in the 4th vol. p. 307, of the Memoirs of "The Philadelphia Society for promoting Agriculture." Should any thing I have written, be considered of utility in aiding the advancement of agricultural science, it is entirely at your service.

I am, with great respect, &c.

ROBERT G. JOHNSON.

RICHARD PETERS, ESQ.

EXPERIMENTS ON CORN.

To the Editor of the Farmers' Register.

King William Co., December 20, 1836.

I this year made an experiment with corn and cotton, planted together; the result of which, I will state, as I consider it as necessary to make known our failures, as to publish our successful experiments.

Two acres of land with a very scanty crop of clover on it, were well fallowed in the winter, after spreading a little manure on the parts where the clover was thinnest—and the last of April re-ploughed and thrown into six feet beds. These beds were crossed at intervals of three feet, and planted the 2nd day of May—each hill alternately in corn and cotton. The cotton seed and corn, were rolled in plaster and ashes, and a small handful of the mixture was put into each corn hill before covering. The corn came up well, and grew off beautifully, maintaining, all the season, a fine deep green color—was left two stalks in the hill, and cultivated in the usual way, and produced 7 barrels per acre. The seed corn used, was the Maryland twin, which from this my first trial, I should say was more productive than any other variety I have tried. The cotton came up badly, grew badly, and produced next to nothing—something like 100 lbs. seed per acre, as I did not weigh it.

Five rows four feet apart, after being planted in cotton two feet apart in the rows, were planted in twin corn between the cotton hills, and the corn left two stalks in the hill, and the cotton two stalks, with a view of ascertaining whether the twin would bear thicker planting than the common large corn. The land was good and well cultivated. The product was one barrel of sound corn, upon one-twelfth part of an acre, and no cotton, that being completely smothered by the luxuriant growth of corn, which satisfied me it would bear planting at least one-third thicker than the common kind. Whether the product from the two acres (14 barrels) was the result of planting twin corn, or whether from the small quantity of plaster and ashes put into each hill, I am unable to say; I only state the facts, and leave others to draw their own conclusions. But I certainly do not think the land would have produced more than five barrels per acre, without the cotton, cultivated in the usual way in the common corn. I now believe I should have made 10 barrels per acre, if I had had a corn hill in place of the cotton—that is, six by three feet.

I have this year tried upon a larger scale, the method of cultivating the corn crop, which one of your correspondents calls the "no hoe system," with which I am very much pleased, having cultivated, in corn, 160 acres with ten hands and four horses, without hoes and without ploughs. As soon as we finished replanting, we commenced thinning; for which purpose we used the hoe, with the view of cutting up a bush or bunch of briers we might meet with, and the hoes were never used afterwards except to chop around ditches or small places which could not be got at with the cultivators, which are started as soon as the corn is up, or even before all is up, and kept running alternately the wide and narrow way until we lay by, which is done with a skimmer. The corn of course is laid off straight both ways. I use a cultivator of the common X kind, except that the teeth are a little pointed instead of square, and the edges of them turned back, which renders the draft easier and makes them run deeper. This method of course can only be practised on land nearly or quite level. The field cultivated this year, I am convinced, has produced more than it did the two last years it was in corn, when ploughed in the usual way, and hoed three times, with a saving of at least one third of the labor. We cannot afford to make corn in the old fashioned way during the present great demand for labor of all kinds, even at the present high price of the article.

Any disposition you may make of the above will be perfectly satisfactory to

H.

P. S.—Upon the supposition that the egg of the Hessian fly is deposited upon the grain of wheat, I this last seeding time, sowed a small parcel of imported German wheat, one-half of which was oiled; but regret to find not one grain in fifty came up, either of that which was oiled, or the other half not greased. It is a well known fact to every good housewife, that their eggs, of all kinds, to hatch at all, must be carefully kept from grease or oil. May it not prove equally as efficacious, when applied to the Hessian fly egg, as when applied to the hen egg? H.

For the Farmer's Register.

COTTON SEED OIL.

1st. In Silliman's Journal of August 1824, is an article on cotton seed gas, by Professor Olmsted, then of the University of North Carolina, now of Yale College, who found by experiment that 1 lb. cotton seed would afford about 9½ cubic feet of gas, and hence made the following calculations.

	lbs.
Cotton made in United States, 1824,	100,000,000.
Cotton seed, more than	300,000,000.
	Cubic feet.
Capable of producing, gas,	2,827,500,000,
Quantity of gas required annually to light the city of London.	400,000,000
To make which are required, Chaldrons of coal,	33,000.

Illuminating power of gas, double that of coal, therefore the whole cotton crop of 1824 was capable of supplying 14 such cities as London with illuminating gas.

In other words, the gas made from the seed of the whole crop of 1824 would have been equal to that made from 462,000 chaldrons of coal. Suppose, however, that only one half of the seed made is converted into gas, then there would be a supply for seven such cities as London, equal to 231,000 chaldrons of coal. But the estimated

	Bales.
crop of cotton for 1836, is	1,500,000,
Or	lbs. 675,000,000.
Seed of which is	2,025,000,000.
Half of which is	1,012,500,000.
	Cubic feet.
Which would afford gas	9,618,750,000.

More than enough to supply 24 such cities as London, and equal to, Chaldrons of coal. 792,000.

The flame of cotton seed gas is distinguished for its purity and softness.

2dly. In the Farmers' Register, vol iii. p. 295, is a summary of the cotton seed oil manufactured down to that date.

The cotton seed huller was invented, as is well known, by Mr. Francis Follet, of Petersburg, about seven years ago. Several other hullers have been made since, but whether on a new principle, or not, seems not to be generally known.

The patent right of Follet's huller was purchased by a Mr. Plumer of Mississippi, for nearly all the principal cotton growing countries in the union, who has refused, it is said, high prices for sub-patents, and thus the cotton seed oil manufacture has been subjected to all the evils of a monopoly, capital and enterprise being excluded.

In the mean time Mr. Baxter, a resident of Petersburg, has procured a patent for a new hydrostatic press, with a pressure of 400 tons. This invention, I doubt not, will form an era in the oil manufacture; and it is remarkable how little it is as yet known. The press is however of no use without the huller, and that, it is seen, is restricted by a monopolizing patent, in almost the entire south-west. Fortunately this patent will expire in seven years. Whether the hydrostatic press is destined to come into the hands of a monopolizing purchaser or not, remains to be seen.

3dly. The value of the surplus cotton seed of the United States, converted into oil, cannot be less than ten millions of dollars—a respectable item in the wealth of the country.

The cotton seed oil is used to burn in lamps in Petersburg, and is said to burn beautifully. It is highly spoken of as a paint oil. A number of houses in Raleigh, North Carolina, are painted with it. It is said to be a fine salad oil, and as a friction oil stands pre-eminent. The oil cake is a capital food for stock, and will itself pay all the expenses of the manufacture.

Baxter's press will make 40 gallons of oil per diem, with a hired labor of three dollars a day. The oil is worth $1 25 per gallon, which will be $50 a day, or $15,600 per annum.

Such are a few hints I have picked up on this matter, and hastily set down. Unfortunately for the public, practical men, who are most competent to give information on such subjects, are the least apt of all others ever to put pen to paper.

C. C.

Jan. 20, 1837.

From Loudon's Gardener's Magazine.

ARTESIAN WELLS.

M. Mulot, who has the management of the process now in operation at the Barrière de Grenelle, near Paris, for forming artesian wells, has already penetrated 1088 feet without finding water. His contract is to bore as low as 1200 feet, and if no water is found at this depth, the engineer is ready to make a new contract with the city of Paris, to go to the enormous depth of 2000 feet; such a depth has never yet been sounded on the surface of the globe. (*Athenæum*, 1836, p. 74.) If the depth of 2000 feet can be attained, at any thing like a moderate expense, it is probable that a still greater depth is practicable; and if so, water may probably be found in every spot on the face of the earth. The fertility of the most arid deserts would thus be secured, and the whole world rendered one fertile garden. The next step would be to call down fire from the clouds, in the form of electricity, so as to facilitate the operations of cooking, and the driving of machinery.

From Loudon's Gardener's Magazine.

ACCELERATING THE GROWTH OF SEEDS BY SCALDING.

Cobbett, in treating of the locust, says, that he was recommended by an American gentleman (Judge Mitchell of Long Island) to boil the seeds previously to sowing them. (See *Arb. Brit.* p. 624.) And the idea is not so ridiculous as might at first sight be imagined. The subject was noticed by Professor Henslow, at the meeting of the British Association at Bristol; and the following is an extract from a communication by the professor to the *Magazine of Natural History*, vol. ii. p. 477:—

"Sir John Herschel lately sent some seeds of an acacia from the Cape of Good Hope, to Captain Smith of Bedford, with directions that they should be scalded, in order to secure their germination. Captain Smith having presented me with a dozen of these, I subjected them to the following experiments:—Two were placed in boiling water, and left to soak for an hour, until the water had become cool; two were kept at the boiling temperature for 1½ minutes; two for 3 minutes; two for 6 minutes; and one for 15 minutes. Some of these were sown immediately, under a hand-glass, in the open border; and the rest were kept for 3 or 4 days, and then sown in a hot-bed. The following are the results obtained:—

Under the hand-glass,—

1, boiled for 1½ minutes, failed.
1 - 3 minutes, came up in 14 days.
1 - 6 - - - 13 days.
1, not steeped at all, did not germinate.

In the hot-bed,—

1, boiled for 1½ minutes, came up in 8 days.
1 - 3 minutes - - 7 days.
1 - 6 - - - 7 days.
1 - 15 - - - 13 days.
2, in boiling water, left to cool - 9 days.
2, not steeped - - - 21 days.

We cannot draw any decided inference from the single seed, which was boiled for 15 minutes, having been more retarded than the rest, as it might have been a bad specimen; but it seems very clear, that the heat to which these seeds were exposed must have acted as a decided stimulus to their germination; whilst it is a very singular fact, that they should not have been completely destroyed by it. Had I supposed it probable that a seed, which was boiled for 15 minutes, would have germinated, I should have boiled some of the others still longer, in order to ascertain the extreme limit to which such severe treatment might be carried without destroying the vital principle."

In pursuance of this subject, at the Bristol meeting, "Mr. Hope mentioned a practice, common in some parts of Spain, of baking corn to a certain extent, by exposing it to a temperature of 150°, or upwards, for the purpose of destroying an insect by which it was liable to be attacked. Dr. Richardson mentioned, that the seeds sold in China for the European market, were previously boiled, for the purpose of destroying their vitality, as the jealousy of that people made them anxious to prevent their exportation in a state fitted for germination. Upon sowing these seeds, he had, nevertheless, observed some few of them were still capable of vegetating." (*Edin. New Phil. Journ.*, vol. xxi. Oct. 1836, p. 333.

From Loudon's Gardener's Magazine.

HEATING BY HOT WATER DRAWN UP FROM THE BOWELS OF THE EARTH.

It seems to be now proved beyond dispute, that the temperature of the earth increases from the surface downwards; and consequently, at a certain depth, the heat of water must be at the boiling point; and at a still greater depth, all materials whatever must be in a fluid state. At the meeting of the Bristol Association in August, 1836, Professor Stevelly suggested the idea of bringing up hot water from the bowels of the earth to the surface; and heating houses, manufactories, &c., with it, so as to keep them at a given temperature, in the same manner as is done with the apparatus by water artificially heated. (*Lit. Gaz.*, Sept. 3, 1836, p. 551.) As, at a certain depth, the water must be at such a degree of temperature, as when allowed to expand, it will instantly become high-pressure steam, it seems not altogether impossible that our stationary steam engines may be supplied with that material without the use of fuel; and hence those who look forward with fear to the period when the coal mines will be exhausted, may derive some small degree of consolation. At all events, it seems not unreasonable to suppose that, if a bore or artesian well is carried so deep as to penetrate into a stratum of water at a sufficient temperature to expand itself into steam, there will be no difficulty in the water ascending to the surface. If ever so complete a command of water should be obtained by man, in every part of the world, except, of course, the frozen zone, the climate and culture of the whole would be altered: and who can tell what may be the ultimate result of the operations of man, in one way or another, chemically, electrically, and mechanically, upon the globe?

From Loudon's Gardener's Magazine.

BEET CULTURE.

M. Soulange-Bodin was some time ago appointed Vice-Secretary to *La Société Royale et Centrale d'Agriculture:* and, on the 10th of April last, I had the pleasure of hearing him read a very elegant discourse, which was highly applauded by the members present, and has since been published in a cheap monthly agricultural journal, called *L'Agronome*. In taking a general review of the present state of agriculture in France, M. Soulange-Bodin notices the great increase of the culture of the potato; and he considers the beet as a source of incalculable riches, not only for France, but for Europe in general. Of course, the value of the beet depends mainly on the sugar which can be procured from it, but not altogether; for the beet is much better adapted, as a green crop, for feeding cattle in a warm climate, than either the turnip or the potato. The culture of the silkworm, and that of the Saxon merinos, occupy a good deal, also, of public attention; and, lastly, the culture of the forests. MM. Vilmorin, Michaux, Jaume St. Hilaire, Mirbel and Loiseleur Deslongchamps, are represented as continually urging the great importance of introducing all kinds of foreign trees among the indigenous ones in the native forests. Great attention, it appears, is being paid to the study of the insects which attack trees; and Michaux is stated to have made some valuable discoveries on the subject: but I refer you to *L'Agronome*.

From Loudon's Gardener's Magazine.

VITALITY OF SEEDS.

It will be in the recollection of our readers, that, in October 1834, we published some interesting details of the opening of a British tumulus, near Maiden Castle, by Mr. Maclean, who found therein a human skeleton, and a portion of the contents of the stomach, containing a mass of small seeds, which neither the operation of the gastric juices, nor the lapse of probably twenty centuries, had sufficed to destroy. Many of these seeds have been subjected to various careful experiments, to ascertain whether the vital principle was extinct; and we have the satisfaction of announcing that Professor Lindley has happily succeeded in producing plants from several of these seeds. These plants have confirmed the opinion expressed by the learned professor, on a first inspection of the seeds, that they were those of the rùbus idæus, the common raspberry. The plants are now very vigorous, have produced much fine fruit this season, and form an object of the greatest curiosity and attraction to horticulturists. This highly interesting circumstance proves the raspberry to be an indigenous plant in this country, growing at a very early period, and then constituting an article of food. (*Dorset Chronicle*, as quoted in the *Bath Journal* of Sept. 12, 1836.) We have seen the raspberry plant alluded to in the Horticultural Society's garden. The facts are extremely interesting; and we hope Dr. Lindley will compare this case with others of the kind upon record, and favor the world with a memoir on the subject.

From Loudon's Gardener's Magazine.

THE STEAM-PLOUGH AND THE SCOTCH SYSTEM OF HUSBANDRY.

At the fifth anniversary of the East Suffolk Agricultural Association, held at Wickham Market, Sept. 8., the most interesting remarks of the evening were the opinions advanced by the president, by Lord Henniker, and by Mr. Shawe, in favor of the new poor law, the steam-plough, and the Scotch system of husbandry. Lord Stradbroke enforced the necessity of improving the implements of agriculture; and pointed to the manufacturing districts for proof that the improvement of machinery brought an increase of wealth to the capitalist, and of comfort to the workman. The agriculturists must keep pace with the spirit of the age in doing their utmost to lessen the cost of cultivation. The steam-plough, of which his former mention had been received with incredulity, had actually been completed, and, with a little alteration, was likely to be brought into general use. He was convinced that means like these were the best that could be devised for the relief of the agriculturists, and by which they might hope to become once more an exporting, instead of an importing, nation. Lord Henniker said he hoped that a day of greater prosperity than they had yet seen was dawning on the farmer, and that his difficulties were nearly at an end. In corroboration of the president's statement as to the steam-plough, he had received a letter from a friend in Lincolnshire, who informed him that in his neighborhood they had got one already, and that it wuuld plough eight acres and harrow thirty in a day. Mr. Shawe thought that some time must elapse before the steam-plough would be brought into general use; and in the mean time, as it appeared by the evidence before the Agricultural Committee that the Scotch system of husbandry was much less costly than ours, he suggested that a deputation should be sent into Scotland to inquire whether any more economical method could be introduced here. (*Bury and Norwich Post*, Sept. 14.) We hope such a committee will be appointed: the farmers of England, not even the most intelligent of them, including what are called the gentlemen farmers, have not the least idea of what farming is in the best cultivated districts of Scotland—for example, in East Lothian. The effects of the subsoil-plough, of Mr. Smith of Deanston, and of the reaping machine of this gentleman, and of the Rev. Mr. Bell, whose machine has been introduced into the United States of America, will astonish them.

RABBITS PREFERABLE TO PIGS FOR MAKING MANURE.

I have these four years past kept several rabbits, in order to ascertain if they would not be more beneficial for a cottager to keep than pigs; but I always lose a great many of the young ones when they are about two months old; and I find it is a general complaint amongst all persons that keep them. If the young could be reared, I am satisfied that rabbits would be far more profitable than pigs, besides making a great quantity of valuable manure, and that out of the refuse of the garden, a great part of which pigs will not eat. I use no other manure than rabbits' dung, and the water which I collect in a cesspool from the drain of the house; and my garden produces good crops of all sorts of vegetables. I should be glad to know if any of your readers have tried rabbits in the same manner as I have done, and what has been the result.—*J. F. Drury, Churchlands, Cheshunt, Nov.* 19, 1836.—*Loudon's Gard. Mag.*

From Loudon's Gardener's Magazine.

SALUBRITY AND INSALUBRITY OF SITUATIONS.

We are persuaded that very few persons are aware of the superior degree of healthfulness of an elevated open situation, exposed to the south rather than the north, and on a dry and, if possible, calcareous soil. Few of us are aware, also, of the superior dryness produced in the floor and the walls of ordinary houses, by raising the lowest living-floor 3 feet, or 4 feet, above the surrounding surface. In laborers' cottages this is of the very last importance, as we shall show on a future occasion. We shall, in the mean time, extract some notices on the subject from Dr. M'Culloch, and from what we consider the most useful review of his book that has yet appeared, in the *American Quarterly Review*, No. viii., for December 1828. "Malaria (bad air,) miasma (μιαίνω, to infect,) or marsh exhalation, is something which originates in swampy, marshy, moist ground, wherein vegetables having grown, die, and putrefy. Vegetables that die and become disorganized in cold weather do not appear to produce this infectious malaria; nor do vegetables that die, and are dried up by heat in a dry place. Nor do we find it in places bare of vegetation, unless vegetable matter, liable to putrefy, be found there accidentally, or brought there purposely. Nor do we find this miasmatous air prevalent in the winter season: the months of July, August, and September, including in warm climates, one half of October, are the seasons when this pestilence chiefly prevails. But it has been observed, that places producing remittent fevers in the fall are liable to produre intermittents in springs. Places completely covered with water do not produce malaria, although the margins of such places do. This poison is now ususually supposed to be a gas, acting by its chemical properties; by others it is presumed to be an exhalation, effluvium, or odor; the ancient opinion, at present not considered as worth investigation, is, that the deleterious quality of the air impregnated with it, is owing to animalcula. Malaria, according to Dr. M'Culloch, is the source of more than half the diseases to which the human race is subject, and of more than half the mortality which depopulates mankind. It seems to be the angel of destruction, ordained to maintain the necessary proportion between population and the means of subsistence. It detracts one half from the value of life in Holland; and at least as much, and probably more, in Italy. The chances of life in England are variously calculated from forty to fifty years. In many parts of Holland they are not more than about twenty-five. In many places of France they are reduced by malaria to twenty and eighteen years. Sicily and Sardinia, and much of Greece, are similarly affected. Lincolnshire, Essex, Cambridgeshire, and the North Riding of Yorkshire are known seats of this pestilence in England. Oliver Cromwell died of it; and, although we are become much better acquainted with its effects and its habits than formerly, great ignorance still prevails, even in England, on this interesting subject. People are not yet aware of the many situations pregnant with latent disease, where danger is not suspected; nor are they aware of the anomalous forms of indistinct, but painful suffering, attributable to this cause where the absence of intermittent or remittent diseases induces a dangerous confidence and security. Dr. M'Culloch is inclined to ascribe to this cause the following list of disorders: Yellow, remittent, intermittent, and nervous fever; dysentery, diarrhœa, cholera, visceral obstructions; dropsy, œdema, obstructions of the liver and spleen, neuralgia, and, in particular, that form of it, the tic douloureux, to which we would be strongly inclined to add the dengue of the Havanna and Charleston, scrofula, and goitre; hebetude of intellect, and general lastitude; a Bœotian diathesis; rickets, hernia, rheumatism, sciatica, toothache, asthma, peripneumony, dyspepsia, palsy, phthisis, chlorosis, are doubtful; not that these disorders, or any of them, do not, in many cases, originate in other causes; but that they are, in many cases, fairly ascribable to the effects of malaria or miasma.

EFFECTS OF LEGISLATIVE AID TO AGRICULTURE IN THE STATE OF NEW YORK.

No. II.

To the Editor of the Farmers' Register.

Dear Sir,—In my former communication in answer to your inquiry of "what has been done by the legislature of New York in aid of agriculture?" I brought down the subject to the year 1830. I will now proceed to discharge the remaining duty imposed upon me. I must be permitted, however, to go back and observe, that the several county societies that organized under the law of 1819, not receiving any farther aid from the treasury of the state after 1825, they, one after another, became extinct, with the exception of the society in the county of Jefferson, where by the munificence, example, and through the influence of Mr. Le Ray de Chaumont, it was not only continued, but gave, in each succeeding year, new indications of great usefulness. This became so evident, not only to residents in that county, but likewise to gentlemen who occasionally travelled through it, that the friends of agriculture began once more to bestir themselves, and proposed the organization of another state agricultural society and the formation of county societies under it. For that purpose, several gentlemen residing in different portions of the state, met in Albany, in February 1832, to devise a plan of operations that would best fulfil their intentions. The meeting was as large as could be expected. A society was formed, and committees appointed to digest and report to a subsequent meeting such plan as would give most efficiency to our views, and likewise to obtain an act of incorporation from the legislature of the state. An act for that purpose was passed, April 26th, 1832. It gave us the power to organize, but no special privileges. We formed our society under the act, and have held our annual meetings in Albany, each succeeding February. I have punctually attended them, and been amply compensated for it. I would not forego the pleasure for a trifling consideration; for, even if the sphere of my usefulness is not increased, a glow of feeling is imparted, which cheers and animates, and makes me more a friend to the pursuit. Several counties once more formed societies, but they did not generally enter the field with that spirit which insures success. Their members again had recourse to premiums to make the exhibitions interesting, but as state patronage was withheld, the funds for that purpose were raised among the members. A sufficiency in this way could not be obtained; it was an up-hill business, and the last autumn has witnessed the expiration of many of these county societies. From former experience, their long duration, under existing circumstances, was not anticipated; their decease, therefore, has not been a cause of much disappointment. We early saw, however, after the organization of the state society, that a paper was wanted, to circulate not only our proceedings, but likewise to impart agricultural intelligence to our farmers. A plan was at once adopted to commence such an establishment, and the Cultivator was issued under the auspices, but not at the expense of the society. That paper has been well sustained by the community—with what benefit, it is for our farming population to determine. Another object we had in view, was the organization of an agricultural school, under legislative sanction. The act (a copy of which I send you,) not having been obtained until May 1836, has not yet been carried into operation. Its friends, however, will not let the subject rest; but, I think, will test it fully. You will observe, it is an act incorporating the subscribers, but without appropriating funds for the purposes recited in it. They, the subscribers, contribute the whole of the fund, and receive the emolument—but, in any event, they are not to divide over 5 per cent. interest on their stock. Upon this plan, they have the entire control of the institution, and they would wish to act, if possible, independent of state bounty. In this way, the enterprise is made their own—they feel more responsible for its acts, and, of course, will take a deeper interest in its success. I cannot permit myself to doubt its practicability, and if we are not disappointed in its results, it will not only do great good in this state, but wherever it shall send its graduates. To develope, however, more fully, what we conceive will be its probable practical effects upon the future increase of our agricultural products, I must acquaint you with what is intended to be taught in this institution. First, *mathematics*—the science which contemplates whatever is capable of being numbered and measured, so far as it leads to a correct knowledge of practical mechanics, the application of the principles of power, and land mensuration. Second, *chemistry*—the science which enables us to discover the peculiar properties of all natural bodies, either in their simple or compound state, so that we can analyze the different kinds of soils, ascertain wherein they differ, and, if possible, in what the principles of fertility consists, and what must be added, or taken away, to make barren or unpropitious land more productive. The doctrine of manures cannot be understood without a knowledge of chemistry; and it is a subject so extensive in its application to farming purposes, that it must become the A B C of the farmer's education. *Geology*, and if necessary, *mineralogy*, so as to discriminate between the different kinds of substances the earth is composed of, that we may have a correct knowledge, not only of what the surface of the soil consists, but what is buried beneath it. *Botany*—the science of plants, or that part of natural history that relates to vegetables, that we may ascertain their different uses, discriminate the exhausting plants from those which are not so much so—the locations most favorable to their growth—the seasons for their production and reproduction—their laws of generation—the alternation that ought to be observed for the best development of their powers, so that whatever plant we cultivate, it will be the most perfect and valuable of its kind. *Entomology*, or more properly, *grubology*—to ascertain the kind, nature and variety of insects that prey upon, destroy or injure our corn, wheat, turnips, fruit, &c. with a view to their protection and destruction. The principles of industry are to be instilled, and the most regular and systematic manner of farming practised. A correct moral deportment inculcated both by example and precept—early rising and cleanliness promoted—in short, the practice of every virtue insisted upon and most sedulously maintained, whilst idleness and vice must receive no countenance. So, that when young men graduate from this institution, their minds shall be well stored with all the information that relates to the peculiar business of farming—their hands taught to give efficiency to the knowledge they have acquired, and their habits formed to give stability to their characters, and make them most useful members of society. In enumerating the studies to be pursued, I may not have been sufficiently select or particular—my object is to give only a general outline of the plan, which, when hereafter put in practice, will be more carefully and systematically arranged.

Suppose such an institution to contain two hundred students, and a course of studies to last three years. It would send each year near seventy young men, so educated, into the different sections of our state. Their knowledge of theoretical and practical farming would be generally diffused; and continue this number for many successive years, it would give thousands of the best farmers, scattering them through every portion of the state. And here let me ask, who is so much of a skeptic as not to believe that agricultural knowledge would not be increased by so great an accession, and in consequence, agricultural products be prodigiously multiplied? But, this is not all; our school would not only send her missionaries of intelligence and industry through this state, but all her operations, so far as competent professors could discharge their duty of instructing or experimenting—of collecting, comparing and examining—of all that was most familiar or rare—ornamental, useful or profitable, in each of their peculiar departments—in a short time we would have a farm and collection, which would vie in extent and appearance, and much exceed in usefulness, the far-famed gardens of London or Paris. Probably, at no time, in the history of our state, could an agricultural school be founded under better auspices for ultimate success, than at present. By the establishment of agricultural journals, a taste for that kind of reading has been created; our citizens are alive to farther improvements, for they have heretofore felt the want of any. The efforts made and making to give a more thorough school education to our population—the ability of our citizens to contribute whatever may be required to carry the object into effect—the easy transmission of produce through every portion of our state by our rivers, roads, canals and railways—the facility of communication with New York, one of the best markets in the world, all are so many aids to the successful completion of the plan. Should this school go into operation, and carry out the great principles of its founders, the time will, ***must*** come, when every citizen will be proud of it as a state institution; when those who have been its friends, will gladly come forward and claim the honors to which they will be entitled, and the present state authorities will take a pride to date its commencement as coeval with their administration of power; for, besides being a test farm systematically managed, its manufacture and collection of the various farm implements, its specimens of geology, mineralogy and botany, the exhibition of its animals, the order and regularity of all its operations in husbandry, the circulation among our farmers of useful intelligence collected there, either from practice or experiment, the aids it will give to our agricultural journals, and above all, the young men it will yearly send out to every portion of our country to vivify by their intelligence, and fructify by their industry, whatever place they settle in, will be so many claims to popular favor, for they will be constant and living evidences of its great usefulness.

I remain your friend, &c.

J. P. BEEKMAN.

Kinderhook, Jan. 26, 1837.

P. S.—We have called a meeting of the commissioners for the 14th of February, to organize, if the subscription warrants, and take the preliminary steps towards the formation of the agricultural school.

AN ACT TO INCORPORATE THE NEW YORK STATE AGRICULTURAL SCHOOL.

[Passed, May 6, 1836.]

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

1. William L. Marcy, John Tracy, Jesse Buel, Stephen Van Rensselaer, Henry Yates, Gideon Lee, Joab Center, John P. Beekman, Cornelius W. Lawrence, Philip Hone, Benjamin Knower, Gouverneur Ogden, Erastus Corning, James Wadsworth, David E. Evans, Hiram Pratt, Walter Cunningham, Gilbert O. Fowler, Nathaniel P. Tallmadge, Nicholas Devereux, Anthony Van Bergen, Garrit Wendell, Archibald M'Intyre, Thomas D. Burrall, John Greig, Thomas W. Olcott, Ziba A. Leland, George P. Oakley, John Delafield, Edward P. Livingston, John Townsend, Lewis F. Allen, and all such persons as now are, or may hereafter become associated with them, are hereby constituted a body corporate, by the name of "The New York State Agricultural School," for the purposes of instruction in literature and science, and improvement in scientific and practical agriculture and the mechanic arts.

2. The capital stock of the said corporation, shall be one hundred thousand dollars, with liberty to increase it to two hundred thousand dollars, to be divided into shares of twenty-five dollars each, which shall be considered as personal property, and be assignable in such manner as the said corporation may, in its by-laws, from time to time, provide: which said capital stock shall be exclusively devoted to the purposes and objects of the

said corporation, as declared in the first section of this act, and to no other purposes or objects whatever. And to the same end, the said corporation shall have power to take, hold, and convey real estate to the extent of its said capital.

3. Jesse Buel, Lewis F. Allen, Henry Yates, John P. Beekman, Joab Center, Walter Cunningham and John Delafield, shall be commissioners to receive subscriptions for, and to distribute the said capital stock of the said corporation.

4. The said commissioners, or a majority of them, shall, within thirty days after the passage of this act, open a subscription book for the said stock, at such times and places as they shall appoint; and they shall give at least fourteen days' previous notice thereof, in at least two of the agricultural papers in this state.

5. At the first subscription to the capital stock of the said corporation, no subscription above one thousand dollars, by, or in behalf of the same individual, shall be received. Five per cent on each share subscribed for, shall be paid to the said commissioners at the time of making such subscription; forty-five per cent thereon, when afterwards called for by them; and the remaining fifty per cent, at the expiration of six months from the time of such subscription.

6. If the whole of the capital stock of the said corporation, be not taken up at the first subscription thereto, the said commissioners, or a majority of them, may receive further subscriptions thereto, from time to time, until the whole capital stock of the said corporation shall be taken up.

7. The said commissioners, or a majority of them, shall, within twelve months after the passage of this act, proceed to distribute the capital stock of the said corporation among the subscribers thereto; and in case there should be subscriptions to more than the amount of such stock, it shall be the duty of such commissioners to apportion the same among the subscribers thereto, in such manner as they may deem most advantageous to the interests of the said institution, and best calculated to promote its objects.

8. The stock, property and concerns of the said corporation shall be managed by thirty-two trustees, of whom the governor and lieutenant-governor of the state, for the time being, shall always, by virtue of their offices, be two; and the remaining thirty shall be stockholders of the said corporation, and citizens of this state. They shall be elected annually, and any seven thereof shall be a quorum for the transaction of the ordinary business of the said corporation.

9. The persons named in the first section of this act, shall be the first trustees of the said corporation, and shall hold their offices until the first Tuesday of February, one thousand eight hundred and thirty-seven, and until others shall be elected in their places.

10. The trustees of the said corporation for every subsequent year, except the governor and lieutenant-governor, shall be elected on the first Tuesday of February in each and every year, at such hour of the day, and at such place as the trustees for the time being shall appoint, and of which they shall give public notice, not less than fourteen days previous to the time of holding such election, by advertisement to be inserted, in at least two of the agricultural papers in this state.

11. At every election of trustees, each stockholder shall be entitled to one vote on each share of stock owned by him, and which he shall have held for at least fourteen days next preceding such election.

12. All elections for trustees, other than the governor and lieutenant-governor, shall be held under the inspection of three stockholders, not being trustees, to be appointed previous to every election by the board of trustees for the time being. Such election shall be by ballot, and by plurality of the votes of the stockholders or their proxies then present; and the thirty persons who shall receive the greatest number of votes, shall, together with the governor and lieutenant-governor for the time being, be the trustees of the said corporation: and if at any such elections for trustees, two or more persons shall have an equal number of votes, then the trustees who shall have been duly elected, shall proceed by ballot, and by plurality of votes to determine which of the said persons, so having an equal number of votes, shall be trustee or trustees, so as to complete the whole number.

13. If any trustee of the said corporation, other than the governor or lieutenant-governor, shall cease to be a stockholder thereof, or shall remove out of the state, his office shall thereby become vacant; and whenever any vacancy shall happen among the trustees, such vacancy shall be filled for the remainder of the year in which it shall so happen, by such person possessing the qualifications above required for trustee of this corporation, as the remaining trustees for the time being, or a majority of them, shall appoint.

14. The trustees of said corporation, as soon as may be after their appointment or election under this act, shall, in like manner, proceed to elect, of their number, a president, two vice-presidents, a treasurer, recording secretary and corresponding secretary, who shall respectively hold their offices for one year, and until others are elected in their places. They shall also appoint such professors, teachers, agents, and other persons as may be necessary to conduct the proper business, and accomplish the declared objects of the said corporation.

15. The said trustees shall, as soon as may be, proceed to purchase a farm of about five hundred acres of land, either contiguous to, or near the Hudson river, and as nigh to the city of Albany as may be convenient; and shall cause to be erected thereon, such buildings as may be suitable and necessary, and make all such other arrangements as may be proper for the future business of the said corporation, and for the accomplishment of its objects.

16. The said corporation, in exercising its power of making by-laws for its own government, shall make it an indispensable requirement, that the professors, teachers, and pupils of the school hereby intended to be authorized and established, shall, unless prevented by sickness or other reasonable cause, occupy themselves for at least one half of the time the said school is in session, between the months of March and December, either in the practical agricultural business of the farm, or in the laboratories or mechanic shops connected with said school.

17. The said corporation shall in no case, out of the profits arising from its business, declare and make a dividend of more than five per cent per annum, upon its actual incorporated capital paid

in and possessed; and if at any time after the payment of such dividend, there shall remain any surplus of such profits, it shall be expended in additions or improvements to the farm, buildings, library, apparatus, or other necessary establishments connected with the said institution, or in reducing the price of tuition at the same.

18. The governor shall appoint annually a committee of three persons, whose duty it shall be to visit the said institution, and to report the condition thereof to the legislature at the commencement of its next session. The members of the said committee shall receive no compensation for their services under this act, but their reasonable expenses shall be paid by the said corporation.

19. The corporation hereby created, shall be subject to the provisions of the eighteenth chapter of the first part of the Revised Statutes, so far as the same are applicable, and have not been modified or repealed.

20. This act shall take effect immediately after the passage thereof.

New York State Agricultural School.

Books of subscription to the stock of the New York State Agricultural School, will be opened at Albany, New York, Poughkeepsie, Hudson and Buffalo, on the first day of June next, at such places as the commissioners may designate. Shares $25—five per cent to be paid on subscribing.

JESSE BUEL, *Albany*.
L. F. ALLEN, *Buffalo*.
HENRY YATES, *New York*.
JOHN P. BEEKMAN, *Kinderhook*.
JOAB CENTER, *Hudson*.
WALTER CUNNINGHAM, *Poughkeepsie*.
JOHN DELAFIELD, *New York*.

REMARKS ON DR. BEEKMAN'S LETTERS, ON THE LEGISLATIVE AID GIVEN TO AGRICULTURE IN NEW YORK.

No person who has read with attention the letters of Dr. Beekman, in this and the preceding No. of the Register, can fail to estimate very highly the benefits conferred on agriculture by the aid of government in New York; and there is no Virginian, who now deplores the waning agricultural prosperity of his own state, and has studied the causes of this decline, who would not earnestly wish to see this example of the State of New York followed, and improved, upon in the Old Dominion. In the noble career of devising and effecting public works, and economical improvements—in constructing canals, and other works of great expense and great value—in aiding private efforts for education by the judicious and discriminating application of public money—and in diffusing the knowledge of agricultural science and practical improvements—New York has truly done much for her own profit and prosperity, and much to induce other states to pursue a like course. Would that our imitation of the policy and action of New York, would both begin and end with these objects!

We mean not to express at length the grounds for either approbation or censure of any of the several parts of the New York system for promoting agricultural improvement, as described by Dr. Beekman. Were we to do so, much space would necessarily be occupied by our remarks—and we should merely be presenting, in another form, opinions which we have urged in various parts of the volumes of the Farmers' Register.

While readily and fully according to the county agricultural societies the merit of having had the most important agency in rousing and stimulating zeal for improvement, yet their organization, and the general plan of premiums adopted, were very defective—and but for these defects, it would not have been so easy for low demagogues to produce the dissolution of the system, by exciting popular envy and discontent.

Another important measure, the collection and diffusion, by publication, of the existing agricultural knowledge of the practical farmers of the state, commands our most decided applause, unmixed with objections of any kind. It was the cheapest as well as the most effectual mode of diffusing agricultural knowledge, and of the most valuable kind—and it is only to be regretted, that the plan of publication was not far more extensive, and far more enduring. The more recent establishment of the low priced and excellent little periodical, the Cultivator, is a similar work, though effected in a different mode. Some objections to the plan of this publication we freely stated, when it first appeared—and the changes afterwards made in its plan, showed that our views were not altogether unfounded. The state, indeed, did not directly aid the establishment, and support, and pay for the (at first) almost gratuitous circulation of this paper: but it amounted nearly to the same thing, when the State Agricultural Society lent all its influence to extend the circulation, and when such men as Judge Buel and Dr. Beekman were induced by public spirit alone, to furnish the editorial talents and labors required for the successful establishment of such a work, without remuneration. To procure a very extensive and permanent circulation for an agricultural periodical, is almost all that is required to insure its cheapness as well as its usefulness—supposing always, that it is conducted with proper industry and ability. It has been recently stated that the issue of the Cultivator amounts to 22,000 copies a year. If the Farmers' Register was taken by as many subscribers, it might be furnished at less than half its present price, and (notwithstanding the high prices of printing in Virginia, compared to the northern cities,) would then give far more profit to the publisher, as well as very far more value to the agricultural public.

The agricultural school established by law in New York, is likewise a work admirable for its design and its tendencies. But we fear that the plan carries within it the seeds of its speedy death, in the withholding of the fostering bounty of the state, and the still more niggardly limit of the possible *profits* to the adventurers or stockholders, to *five per cent.* per annum! It can scarcely be expected, that those who have thus vested their money, will derive any gain, except the applause of their countrymen, and their own gratification for rendering service to their country's best interests. But if it were possible that the pecuniary profit could amount even to fifty per cent, or that such returns could be expected by the most sanguine, it would be very short-sighted policy to destroy all ground for such hopes, and thus remove the only never-failing motive to serve the public, which is presented in *self-interest*. But such an institution, however profitable to agriculture, and to the community in general, is not to be expected even to support itself, much less to yield a pecuniary profit on the investment—and the state, that will receive so much benefit therefrom, ought, both in justice, and in good policy, to pay all that may be wanting for the expense. Every youth thus educated, and who would devote his life to the labors for which he had been so admirably trained and prepared by the studies and labors of the school, would be of more value to his country than ten times the whole cost of his education at the agricultural school; and the state would make a capital bargain to defray only half the expense of thus educating annually any number of boys, who would, by their labor or their money, pay the other half of the necessary expense of such an education. This would be in accordance with the excellent plan of New York of sustaining common schools and agricultural societies—which is by aiding individual efforts, in proportion to the amount of money contributed by individuals—and not by grants entirely gratuitous, as annually and lavishly made to to the altogether worthless primary (or pauper) school system in Virginia.

From the Genesee Farmer.

FATTENING ANIMALS.

The high prices of grain the present season, has brought the question home to the business and bosoms of farmers, whether merchantable grain of any kind can profitably be used in fattening beef or pork for sale. We think that it cannot; and we have no doubt the verdict of practical farmers will in general be with us, even when the high prices of meat are taken into consideration.

The confessions of some of the most celebrated dealers in cattle in England, admit that where cattle are purchased for fattening, and fed in the most accurate and scientific manner from the best materials, that there is oftener a loss than a gain by the process; and that most of the compensation consists in the pleasure of seeing a number of beautiful and fat stall-fed cattle. Where the process of fattening in this country is carried on in the same way, with merchantable grain, the result has in general been found very similar. Where the feeding has commenced on grass, been carried on with roots, and finished with these, or with meal, a handsome profit is frequently realized by the feeder.

So with pork. The farmer who commences with sound corn, and finishes with the same, as he must if he begins with it—will have most likely good pork, but of a price which will more than compensate for any superior excellence it may possess. On the contrary, the farmer who allows his pigs a clover field, the gleanings of his orchard, and the benefit of his dairy through the summer; things that are worth little in themselves, will find them when the time arrives for fattening, well grown, and in good condition—in attaining which two things, nearly one-half the corn given pigs is usually consumed. In this state, when put up, little of valuable food is lost in the fattening; but the peas, barley or corn given them, ground or steamed, *tells* at once and perceptibly.

The introduction of the root culture, especially the ruta baga, has effected a complete revolution in the manner and profits of fattening cattle among farmers who are willing to be taught by experience. The saving in time and expense given in this way to the feeder, and the rapidity with which fat will be taken on by the animal that eats freely, would surprise one who had not tried the experiment. There existed at one time a senseless prejudice against the ruta baga for fattening cattle, grounded on the assumption, that the roots gave an unpleasant flavor to the beef. This notion may still exist among those who have not tried them, but twenty years experience in England and in this country, has shown the fallacy of such a supposition.

We saw a small cow knocked down the other day, that had been dried off late in autumn, put into good clover-feed for a month, and then fed with ruta baga for about the same time. She would eat a bushel in the morning, and another in the evening; and had a supply of good hay and salt, with occasionally a basket of soft corn, in the room of the turnips. The beef was of a very superior quality. and she gave one hundred and forty pounds of tried tallow. We do not mention this as any thing extraordinary; but, since the turnips at the most did not cost over six cents per bushel, it is evident the profits of this mode of feeding must be much greater, as well as made far less troublesome, than that formerly practised.

From the New England Farmer.

THIRD ANNUAL REPORT OF THE MANAGERS OF THE BOSTON ASYLUM AND FARM SCHOOL.

The managers of the above institution respectfully submit to the corporation the following report:—

The present board of managers was elected in the month of June last, and this report commences with that period.

The objects of the institution are presumed to be well understood. To rescue from the ills and the temptations of poverty and neglect, those who have been left without a parent's care; to reclaim from moral exposure those who are treading the paths of danger; to "place the solitary in families;" to give to those who know nothing of the ties or influences of home, some taste and fondness for a local habitation, at the least; and to offer to those, whose only training would otherwise have been in the walks of vice, if not of crime, the greatest blessing which New England can bestow upon her most favored sons, a good education, are some of the purposes for which the Asylum and Farm School was endowed. Under the blessing of God, success has thus far attended the exertions which have been made to accomplish these objects. From the monthly reports of the superintendent, and from the personal examination of the establishment on Thompson's Island, the board of managers are satisfied that there has been much improvement in the character of the boys who have been committed to the charge of the institution. In the last report of the superintendent, 62 boys are placed in the highest or first grade, 40 in the second, 4 in the third, and 1 in the fourth.

The number of boys on the island at the time of the last report, was 92; since that time 18 boys have been admitted, and three withdrawn. The number on the 1st of January, 1837, was 107; all of whom, as well as all other persons connected with the establishment on the island, were in good health, and there has been no death at the institution since the last report was made. The occupations and employment of the boys vary with the season. In spring, summer and autumn, the larger boys, in classes, work upon the garden and farm, of whose labor they perform a large part. The younger boys have small gardens of their own, which afford them recreation when released from school. In the winter season most of them attend school, where they are instructed in the learning usually taught in our common schools, and some of them assist in making clothes and mending shoes. The winter evenings are occupied with the study of geography, and the use of globes; botany, and practical agriculture; lecturing on different subjects, singing and reading. The superintendent states that "every boy in the institution is required to be present during the evening exercises, if he is able, which are very pleasing to them, and which we all enjoy very much."

A large number of mulberry trees have been planted upon the island, and there are many silk worms at the establishment. It is contemplated to improve the advantages of the location in the production of raw silk for manufacture.

As to the success of the boys in the farming operations, Capt. Chandler, the superintendent says, "they have succeeded far beyond my expectations; I think they have done more work, and done it better, than the boys of their age who have been regularly brought up to the business in the country generally do." And as to the comfort and contentedness of the boys, he says, "they are all comfortably clad with woollen clothes, shoes, stockings and caps, and appear to be as happy in their present situation as boys generally are under the paternal roof. They appreciate their advantages, and most of them are grateful to the benefactors of the institution and their friends for placing them here. The boys are well supplied with books, and keep them in excellent order; our library contains between 4 and 500 volumes of well selected books. I have also an agricultural library containing about 30 volumes, to which the boys have access."

Opportunities are occasionally offered to the friends of the boys at the institution, of visiting them on the island in the summer months.

The school is under the immediate charge of Mr. George B. Hyde, and he as well as the superintendent and all engaged in the establishment, are believed to merit the continuance of the confidence which has hitherto been reposed in them.

During the past summer, several parties of ladies and gentlemen, at the request of the board of managers, visited Thompson's Island. At these visits there have been many persons present, and an examination of the boys in their different studies has been accompanied by some remarks on the objects and prospects of the institution. Among those who have thus visited the island, have been many strangers, who have always expressed their interest and pleasure in its objects and condition.

And how should it be otherwise than an object of interest? an institution designed to rescue the destitute orphan boys of our city from vice and ruin; to withdraw them from scenes and associates, whose contaminating influence would quickly destroy the perceptions of conscience, and leave them, deprived of that monitor, to pursue the impulses of passions which inevitably destroy their victims. Many are the worthy objects of the charitable institutions among us; our hospitals relieve the sufferings of the sick, and restore them to health and usefulness; they are a blessing which may be required by all of us, and we would not detract from their deserts. But we concieve that an institution which is to rescue immortal beings from the stain of sin, which could hardly otherwise be avoided, which is intended to have an influence on the youthful mind, and lead it to an understanding of its own capacities, responsibilities and hopes, deserves the fostering care of an enlightened, benevolent community, as much as those associations whose aim is to cure the diseases of the body, or to restore the wanderings of intellect. Such an institution as the Asylum and Farm School, is in true accordance with the spirit of the pilgrims; it carries into effect the first objects of their solicitude. the education of the young—of that young whose talents would otherwise be employed to violate the peace and virtue of society.

It will be seen by the report of the finance committee, that the expenses of the institution for the year ending January 1, 1837, have amounted to $6,100, while the receipts for the same time have amounted to 3,500, leaving a deficiency of $2,600. To meet this excess of expenditure over income, and to prevent its recurrence, it will be necessary to appeal to the liberality of the public. The board of managers had intended to have made that appeal in the autumn of the past year; but the condition of the financial affairs of this community induced them to defer it. They would recommend the subject to their successors as one requiring their attention when a suitable time shall have arrived for its execution, with the confidence that the appeal will be cheerfully and promptly answered.

For the managers.

WM. GRAY.

REAL FRIENDS TO AGRICULTURE.

With pleasure we again acknowledge the receipt of one hundred and fifty dollars, from the Rhode Island Society for the Promotion of Agriculture, to pay for the New England Farmer, for distribution among its members. Let other agricultural societies go and do likewise, and we promise them that our most earnest endeavors will be to render a fair and full equivalent.—*N. E. Farmer.*

Communicated for publication in the Farmers' Register.

PROCEEDINGS OF THE AGRICULTURAL SOCIETY OF BUCKINGHAM.

At a regular annual meeting of the Buckingham Agricultural Society, held at Robert Shaw's, Esq. on the 20th October, 1836, the meeting was called to order by Maj. Charles Yancey, the president, and after the reading of the proceedings of the last meeting, the president delivered the address in accordance with a resolution of the last meeting.

Resolved, That the president be requested to furnish a copy for publication in the Farmers' Register—also, that three hundred copies be published for the use of the members.

Resolved, That in future the exhibition of stock, &c. be on the day after the annual meeting in each year.

The reports of the committees were received, viz:

On Farms.

The first premium, to Col. Thomas M. Bondurant.

The second premium, to Dr. William P. Moseley.

The third premium, to Maj. James M. Patteson.

On Horses, &c.

The first premium, to Maj. Charles Yancey's Gohanna colt, 4 years old.

The second premium, to Maj. Charles Yancey's brood mare, Jenny Dang.

The third premium, to Maj. Charles Yancey's Greybeard colt, over 2 and under 4 years old.

The fourth premium, to Capt. William N. Patteson's Washington colt, under 2 years old.

The fifth premium, to Dr. William P. Moseley's Janus colt, other than thorough bred, under 3 years old.

The sixth premium, to Mr. Robert Moore, for jack, John Blue, over three years old.

Cattle, &c.

The first premium, to Capt. Richard G. Morris, for his Devon bull, Mitton.

The second premium, to Rev. Jesse S. Armistead, for his Durham heifer, Kitty Hossack.

The third premium, to Dr. William P. Moseley, for his fat cow.

Hogs, &c.

The first premium, to Col. Granderson Moseley, for the heaviest hog, live weight, under 1 year old.

Domestics, &c.

The first premium, to Col. Beverly A. Brown, for his blue suit.

The second premium, to Dr. William P. Moseley, for 20 yards carpeting.

The third premium, to Dr. William P. Moseley, for the best counterpane.

Election of Officers.

William P. Moseley, elected President; George M. Payne, J. S. Armistead, and Robert Moore, Vice Presidents: Granderson Moseley, Recording Secretary; William N. Patteson, Corresponding Secretary; James M. Patteson, Treasurer; William C. Moseley, Thomas M. Bondurant, Richard G. Morris, William Lewis, Jesse Holeman, and Patrick H. Elcan, Directors.

Resolved, That the proceedings of this meeting be furnished the editor of the Farmers' Register, and that he be requested to publish the same.

Resolved, That this meeting now adjourn till the 3rd Thursday in October next.

CHARLES YANCEY, *President.*

GR. MOSELEY, *Rec. Secretary.*

N. B.—The competition in cattle, hogs, sheep, and domestics, would have been more numerous, but for a misunderstanding as to the day of exhibition.

GRANDERSON MOSELEY.

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ADDRESS TO THE AGRICULTURAL SOCIETY OF BUCKINGHAM.

By Charles Yancey, Esq.

GENTLEMEN:—At our last annual meeting of the Buckingham Agricultural Society, when I was not present, you conferred on me the high honor of electing me your president for the present year: for your kindness and partiality in confiding to me this honorable station, I now tender to you my unfeigned and grateful thanks. In compliance with a resolution of the board, requiring me as your president, according to usage heretofore, to deliver an address to the society at its present annual meeting, I now proceed to discharge that duty with much diffidence, being fully aware of my want of qualification to do justice to the great and important subjects of agriculture, horticulture, and other subjects that I deem proper to include in this address. Agricultural husbandry, from the earliest ages to the present day, has ever been deemed, and wisely considered, as the nursing mother of the arts; and the basis of the comforts, prosperity, and the support of the whole human family. When our first parents offended against the first divine law of the Almighty, a curse was laid upon the earth for their transgression. That is, it was doomed to grow thorns and thistles, which I understand to be the type of the long list of every noxious plant that now infest the earth; consequently it was decreed, that Adam and all his descendants should "eat bread in the sweat of their faces"—that is to say, should procure the bread of life by labor, for the purpose that labor should be indispensable, to render the earth capable "of bringing forth its increase." It is then a divine command to labor: and I assert with confidence, that no manner of labor is more honorable, more independent, more certain of reward, more virtuous, peaceful and happy, than the cultivation of our mother earth.

How gratifying, how consoling, the reflections of those who sow and who plant, that are permitted by the dispensations of Providence, together with their own labor and toil, to harvest a bountiful increase of crops to the ample supply of their household, and a large surplus to supply the wants of their fellow-men.

I consider slavery an evil of great magnitude, yet I am not in favor of abolition—very far from it. No remedy for the evil has presented itself to my mind, but would produce a greater evil to society, than a continuance of servitude in the mild and humane form in which it at present exists. The philanthropist, fanatics, and those who really entertain religious scruples, who have a knowledge of the relative duties of master and servant, as practised in Virginia, must all admit that the situation of our servants is greatly preferable, as to all essential comforts of life, compared with the situation and condition of the poorer order of white people, in the non-slaveholding states, and certainly much better than the condition of the free people of color residing among us, or their savage ancestors, naked and starved, roaming through the wilds of Africa like the wild beasts of the forest, deprived of the light of revelation, and all the social and endearing relations of civilized life. Slavery was introduced in this country, by the sordid policy of the British government, for which we of the present generation cannot be held accountable; but we are accountable for a just discharge of our duty as masters, in extending to them mild humane treatment, with a due regard to their morals. Abolition can never be forced by the clamor of fanatics, which can only make the situation of slaves less tolerable, and delay the process of public opinion, in devising some plan for commencing a system of abolition, which, commence when it may, must take its origin in some of the slave-holding states.

I consider one great objection to slavery to be, that by fashion, pride, and folly, the fathers of the land have relied mainly upon the reluctant labor of slaves for the support of their families, to the neglect of the important duty of rearing their sons to labor, either in the mechanic arts, or on the farm; to train them up to industry and economy, thereby lessening the inducements of vice and immoral practices—the bane of society, to which youth unemployed in some regular daily avocation, is peculiarly liable. Indolence is the mother of vice and dissipation, destructive of health, morals, and all the social relations of life, and the certain forerunner of poverty and want. Besides, slavery is an evil in this point of view; by means of slave labor, the most valuable region of country under the sun, has been worn down and exhausted by the culture of tobacco—a plant that yields nothing for the support of man or beast, a great exhauster, its culture very laborious, and certainly under no circumstances will it ever be cultivated by white labor. Furthermore, these people under humane treatment, the strength and vigor of the females acquired by moderate labor, multiply and increase upon us, faster than our means of procuring additional lands to work them upon. With a redundancy of labor for the extent of our farms, no plan of improvement can be advantageously adopted. The inquiry naturally presenting itself is, what is the remedy? I answer, lessen your force. There never was, and probably never will again, be a more propitious time than the present, to dispose of your slaves; and forthwith resolve to commence upon the improvement of your exhausted fields, by making and applying all the manure in your power, of animal and vegetable matter, such as corn stalks, wheat straw, and leaves taken from the poorest part of your woodland, designed for timber and not for cultivation. Much can be done in this way to increase your quantity of manure, and then rely upon clover and plaster, as the great auxiliary of the whole vegetable kingdom by which you can renovate your exhausted lands, and bring them up into good tilth again. Now gentlemen, let me intreat and beseech you to commence the clover husbandry as the only known process by which you can render your lands fertile; you must not mind the expense; the money expended will return to you with usurious interest, in augmented crops, and renewed fertility of your exhausted lands, and amply reward you for all expenses, time and labor employed. One of two things must of necessity be done, either to improve your lands, or sell the bones of your fathers, as too many have done, and exile yourselves and families from the attachments of nativity, friends, and relations, and make an unmanly retreat, to the fat lands of the south-west, where you will risk the diseases incident to a hot sun, and, perchance, to many members of your family an untimely grave. Now gentlemen, let me again conjure and entreat you, being sincerely desirous to promote your interest, and can, from many year's experience, recommend the clover system, as the best mode of improvement—to prevail on you, one and all, to adopt it the next season—to sow upon your wheat and oat land a gallon of seed to the acre, bearing in mind, that poor land requires more seed, as many will fail to vegetate. Poor exhausted places in your fields should have a dressing of some kind of manure, and be freely plastered; oats should be seeded thin, as they incline to branch much, of moist springs, when they will injure the young clover. My preference as to time of seeding upon wheat land is the last ten days of February; and when the land is much heaved up by frost, when rains will settle it down, and give a cover to the seed and insure vegetation. If the ground be dry, hard and compact, I recommend a light single horse harrow with white oak teeth, to pass over the field, which will greatly assist the seed in vegetating, and instead of injuring, as many would suppose, greatly benefit your wheat, especially if the roller is made to follow the harrow.

Young clover seldom dies for want of moisture till the grain crop is cut. If the season then be dry, having been sheltered and protected from the heat of the sun sufficiently, when an application of plaster, of from three to four pecks to the acre, will be very timely, and greatly tend to preserve the young clover. For the second application of plaster the next season, I prefer the time when vegetation is fully abroad, and the clover near heading; there is then more vegetable matter for the plaster to act upon. Clover and plaster should be like man and wife, never separated; for without plaster, the crop will be feeble and sickly. Every farmer must feed his land either with manure, or clover and plaster, or it will not feed him, and will withhold from him that increase which would reward him for his care and labor.

Hoof nor tooth, should be put upon clover before it is in full bloom—at any earlier stage is very destructive: and never at any time graze clover in the first year of its growth. I mean, when in bloom the second year, when if the crop be heavy, there will be more clover than the plough can well turn under. It will then not be bad management to permit your stock to derive the benefit. Sheep and hogs injure less than horses and cows. I will suggest to you that all good managers sow clover to improve their lands, and not for the purpose of grazing.

It will readily be perceived by you all, that the old three-shift (or land killing) system, must be abandoned; for with less than four shifts, the clover husbandry ought not be attempted. Five shifts is much better—but with those who lack surface commensurate with their operating force, by forming grazing lots of from two to four acres each, according to circumstances, upon lands adapted to grass, and sown with greensward, orchard, and herdsgrass—as different grasses mixed, succeed best in forming the strongest and most durable turf to resist hoof and tooth, under annual grazing. Twelve acres in such lots, well sodded with these grasses, will keep more stock than a common hundred acre grain field: say six lots of two acres each; three are to be under grazing at the same time; when eaten down, turn in upon the other three; when they are consumed, the first three will again afford a good bite. These lots can be enclosed by hurdles, sufficient for three lots, by removal as you change your stock, and may be kept up for a series of years, by cutting the turf every three or four years with a coulter plough, and an annual dressing of plaster, with a top dressing of manure occasionally. With the aid of such lots, the four-shift system can be made to answer tolerably well. Five shifts, I prefer to a greater number—for experience and observation teach me to believe that our lands will require a hoe crop to cleanse them every fifth year. If permitted to lie longer, they become foul and wormy, and overrun and infested with sassafras, locust, briers, sorrel, blue thistle, and St. John's wort, &c. requiring great labor in shrubbing and preparing the ground to receive a crop.

Clover hay I consider equal if not superior to any other kind of hay, and readily made in fair weather. A very common error in curing it, is exposing it too long in the sun, which parches up the leaves and makes the hay poor. It is better to sun less, turn it every hour so as to make a fresh exposure to the sun through the day—at night, before the dew falls, cock it up in convenient hand stacks, there let it remain two fair days, and it will be cured by its own heat and the air, when it ought to be hauled in, and if any part be not sufficiently cured to keep, a little exposure upon the yard will make it safe to place away in the hay house, or in a rick—if the latter, it should be sloped off like the roof of a house, and covered with straw or top fodder—otherwise, the hay will sustain damage by rains. I estimate a quantity of well cured clover hay equal to the like quantity of sheaf oats, especially if cut, as the oats usually are, and ought always to be. Hay when cut like oats, is less subject to waste—the stock eat it better, and derive additional nutriment, perhaps, equal to 10 per cent. It is admitted by the best farmers, that oats make a hasty and heavy draft upon land, and that clover is an ameliorating crop, drawing much less from the land, growing and sustaining itself upon atmospheric air and moisture, and known to be the greatest improver in the whole vegetable kingdom. It would then seem to be good economy to lessen the oat crop, and substitute clover hay.

The manner of planting and cultivating corn is believed to be well understood, consequently I shall be brief upon this subject. There is no doubt that one stalk of corn will grow better by itself than two stalks together; from which it may be inferred that it is best to drill, upon lands of every quality. I think otherwise; and will advise that such lands as will produce 20 bushels, and upwards, to the acre, only, should be drilled, excepting hill side land, regardless of quality, should always be drilled in a horizontal direction, to prevent washing; and leaving your plants asunder in the drill, according to the strength of the soil, from nine inches to two feet and a half. Upon lands a grade lower in tilth, I would plant and cultivate three feet six inches each way, which is as near as can be conveniently ploughed. And upon lands a grade lower in quality, four feet each way, and in both cases, a single stalk. In planting corn in drills, I advise that the beds be opened deep, and the corn planted as deep in the bed as the surface soil. A higher elevation, near the top of the bed, greatly exposes it to want of moisture in dry seasons, and much more liable to blow down in stormy weather. To drill the whole crop of corn, does not suit tobacco growers, as it requires much more hand hoeing, and at a season when you are busy putting up tobacco hills and planting tobacco. Ashes is a most valuable manure for corn; a pint of which, put underneath your corn in planting, and a little earth drawn over the ashes before dropping the corn, I believe, upon old exhausted land, will increase the crop one-third in quantity. As to the effect of common manure you are all well informed. Corn land should always be harrowed down before planting, which working is as valuable as a ploughing after the corn is up. In the first place, it prepares your land to receive the seed corn, and in the next place it destroys a young crop of grass and weeds, which will permit you to delay the first ploughing, and consequently the second, without injury to your corn, and enable you to embrace the whole grass-growing season, and make good corn with two ploughings, which if well done, and done at the right time, no more ploughing will be required; the cultivator then, will destroy a young crop of grass, and level down your land in good condition for seeding wheat. From experience I am of the opinion that seed corn should be saved from stalks that have produced two ears. Whether it be sex or not, I cannot say, but have observed it is most apt to produce its like, and that likeness increases as you continue the process.

My plan to prevent crows and blackbirds from pulling up the corn, is to soak the seed corn in copperas water, made strong—to remain in it till the grain is somewhat swelled and turned black. It is thus rendered obnoxious to those birds, and vegetation greatly expedited. I consider this method preferable to tarring corn, which, if smeared entirely over the grain, makes it impervious to moisture, which will cause it to rot, instead of sprouting.

I advise a change of grain for seed about every seven years; but an exchange with neighbors, cultivating the same kind of land, will not fully answer the purpose; a change of seed should be sought from lands of a different description from those designed to seed upon, and it is thought by agriculturists of much experience, that seeds and plants brought from a northern to a southern latitude, flourish and succeed better than those brought from a southern to a northern latitude. Time and experience will decide the question. The wheat crop with us is a delicate and uncertain one. The best means of success is to improve your lands which have been so long and so hard cropped under the three-shift system with but little aid, that the portion of lime it formerly contained is entirely exhausted. Under this impression, I recommend a free use of lime, a constituent part of wheat, and very essential to its growth. Small seed of every kind require a high preparation of land to insure a good crop; then prepare your wheat land well, and seed, if possible, in all the month of October, regulating seed according to the fertility of the land, from four to seven pecks per acre—the latter is sufficient for our richest bottom land; and exhausted land that will not bear four pecks to the acre ought not to be sown in wheat, but with clover the last of February, and well plastered in March, together with a top dressing of coarse manure. The opinion, entertained by many, that clover requires the shelter of a grain crop to protect it from the sun, is not well founded. Many of you, no doubt, have seen as good clover where your corn piles stood and not seeded in wheat, as that which had been sheltered by the wheat. It is admitted that young clover is much more subject to die upon poor, than rich land: the best protection against the sun and drought, is a free application of plaster and manure. Lands not sufficiently waving to carry off water quickly, should be well bedded, and water furrowed in every direction necessary to vent the water. They should be attended to throughout the winter, after sudden thaws and heavy falls of rain, which will choke up the furrows and cause damage to the wheat. Lands that are subject to heave up by frost, should be rolled, with a roller 18 inches in diameter and 4½ feet long. This operation, too often neglected, will amply pay you for the labor. Any application of manure is better in a top dressing, about the first of March, than to be ploughed in before seeding.

From long-continued culture without any improvement, our corn fields are greatly deteriorated, and will not yield a plentiful supply for the use of the family. The first great and certain remedy, is to increase the fertility of your lands; and the second remedy, is to use economy; for there is more judgment in feeding out a crop of corn, than there is in making it. A great saving will result in grinding all your stock corn, into fine meal, and feeding it mixed with cut hay, fodder, shucks or straw; in this form, I estimate three quarts equal to four of corn, a saving of 25 per cent. to those who have mills; to those who pay 10 per cent. toll, a saving of 15 per cent., an object well worth your attention, and I hope many of you will test the estimate, fully believing that all who do, will concur with me in opinion; and I will further add, that when fed in this form to old animals that chew corn imperfectly, the saving would be one half. Much can be done in aid of the corn house, by cultivating largely, for the use of stock, the bulbous roots, the mangel-wortzel, the round potato, and turnips; the former is said, from one acre, to produce fifty tons weight, including tops and roots. The leaves are large, and will bear three cuttings in the season, to be either used as summer food, or cured into hay and preserved for winter use. I have raised them to weigh fourteen pounds, which is not near the heaviest size. I have no doubt, that from an acre really made rich, the plants set in rows, two and a half feet apart, with twelve inches space between them, and well cultivated with a coulter plough, with the necessary hand hoeing, would produce a greater crop than could be raised from any other vegetable whatever. The round potato is indiginous to this continent, though improperly called the Irish potato. It is a root of great value, adapting itself to almost every climate, sustaining more of the human family, than any other root in the world; and good food for cows and hogs. The turnip is a poor watery root, possessing but little nutriment—by boiling it, root and top, it is freely eaten by cows and hogs, and serves to fill them, and afford some nutriment. The keeping of animals full, is essential, either in fattening them, or in preserving their present plight. Feed a horse extravagantly upon corn alone, and you cannot fatten him without a due proportion of long provender; and if that be withheld from him a few weeks, he will become unhealthy. The pumpkin is very superior food, being much more nutritious than the turnip, and is eaten by horses, cows and hogs, and much less injurious to lands upon which they grow. They delight in a light sandy loam, and in good seasons are very productive. You will increase the crop by plucking off the first blossom nearest the root-stalk, for if that is permitted to form a pumpkin, it impoverishes the vine throughout its whole extent.

Tobacco being our great market crop, it will be expected that I treat upon the culture and general management of that plant. It being very important to have forward plants, the best selection of suitable ground for your plant beds must be made. New virgin soil is preferable where to be had, with a southern exposure and the command of water, where practicable. With the command of water and good fresh horse manure, plants can be raised early, and in despite of the fly, that are, in dry cool seasons, so destructive to our plants. I prefer a close fine soil, with as little sand as possible: rather than a light puffy soil, I would take black-haw swamps, or white-oak land, which are inclined to be adhesive and somewhat cold, with shallow soil. I will here remark, that such a soil, with the aid of manure, will produce your plants with better roots than native rich land: such land, when well burned, will divide its particles to great fineness, imbibe and retain more of the stimulus imparted to it by the action of the fire, and retaining its close compact nature, yielding moisture to the roots of the young plants, which in an open light soil, would be evaporated by the sun and drying winds of March, when the plants perish. The next process is burning; the extent of which the best rule I can give, is to burn till the ground assumes a red appearance; bearing in mind, that burning late in February, and early in March, must be less than what would be called early burning. The largest coals must all be taken off with a fine rake, then hoe up your bed, not exceeding two inches in depth, and avoid turning over the soil. Now put on horse manure all over your bed, then chop over with the hoes repeatedly, until the ground is reduced sufficiently fine, removing all the roots that can be got out, large and small, taking care not to rupture the substratum by pulling up large roots; mark off your bed, and sow a common table spoonful of tobacco seed for every hundred square yards, dividing your seed, and sowing one-half lengthwise, and the other half crosswise, by which means you will sow your bed more regular; tread and cover well, and you may expect plants in due season, provided you give another dressing of horse manure, made fine enough to sift through a basket, when your plants are generally square, and at the time when rain is expected. Seasons for setting plants being uncertain, we usually embrace seasons in the month of May, yet I greatly prefer planting from the 1st to the 15th of June. It will come to the knife sooner, and make larger and better tobacco, than if planted in May. Tobacco requires early and deep working with a coulter plough first, then with a scoope to make fine earth, and instead of the old mode of ridging down, it is much better to hill it. At the second working, plough and hill in the same way, and if well done, and at the right time, it scarcely will require a third working. All the necessary working should be performed by the time your plants are in the second suckers; after that period, a working is often prejudicial. Young grass in that stage of its growth will not injure; indeed, it defends the plants from dirt upon the bottom leaves, and will cause it to ripen of a yellow grey color, and make tobacco of a finer fibre, and more easily cured. Weeds will injure, by the winds whipping the leaves against them; they should be plucked up by the hands when suckering. I recommend low priming and topping—the shorter the stalk, the richer the tobacco. Take out the bud as soon as practicable, without crippling the bud-leaves. In my opinion, eight leaves is better to top to, than any greater number, even upon rich lands; it will make richer tobacco, more certain to make itself, and come to the house before frost, than any greater number of leaves. It is often seen upon weak land in dry cool seasons, the two top leaves of ten-leaf topping will not ripen, and they ought to be the two best leaves upon the plant—when, if eight-leaf tobacco had been in the same hills, it would have ripened to perfection, with longer and broader leaves, richer, heavier, and every way better tobacco. Besides, it will come to the knife two weeks sooner, making the crop much more certain, and enable you to seed your tobacco land in wheat that much sooner, which is a great consideration with every farmer.

A very great and common fault in tobacco makers, is cutting tobacco before it is ripe, by which the loss is great, in quantity and quality. In an address of this kind, there is much difficulty in giving you a criterion, by which to know certainly when it is really ripe—for tobacco often assumes the appearance of ripeness (especially in dry weather,) when it is not ripe. I will, however, say, that when most planters think their tobacco is ripe, if they would delay cutting one week longer, it would then probably be ripe. I will draw your attention to the point of the top leaf on the north side of the plants. From the stalk to the declining part of the leaf, you will see yellow spots, which is the oil separated from the water; from thence to the point, if green in color, it is water only, and ought not to be cut until the oil has reached the point of the leaf. There is as much difference in a chew of good ripe tobacco, compared with a chew of half ripe, as there is in a ripe and half ripe water-melon. Unless the intense heat of the sun forbid it, (such heat as we had in the last month,) I always scaffold tobacco. As to the time when it ought to be housed, and fire applied, nothing is more indefinite, depending upon the degree of ripeness, the kind of land on which it grew, the strength of the sun, the state of the air, whether dry and cool, or warm and moist, and whether it ripened of a yellow-grey, or green color; the latter always containing more water, and longer before the water and oil separate. The best guide is this separation, the water having escaped through the mouths of the leaf vessels, where you see the yellow spots of essential oil, and the remaining green and watery part of the leaf approaching that process. A slow fire and weak heat must be applied, say eighty degrees, for if your tobacco gets too yellow, the vessels become so open, the least degree of heat too strong, will force out the oil with the water, kill the staple and cure it up red, the most worthless kind of tobacco that is made, there being no essential oil in it, in which the value of tobacco entirely consists. That degree of heat ought to be continued, but not increased, one natural day; after that toasting, the tobacco is prepared to bear an increased heat of five degrees more, the next natural day; the third day 90 to 95, and the fourth day 105 to 110 degrees, which ought by that time to cure the leaf perfectly; but of that fact be certain, by a nice examination above the joist, where the process of curing is the slowest, before you raise heat to 140 or 150 degrees, which is necessary to reduce the stems; even a greater heat if your tobacco is very large. There is then no danger of injuring your tobacco; the mouths of all the vessels are sealed up, no oil can escape, and your tobacco will be finer in fibre, closer in texture, and the large stems well reduced, exhibiting a fluted appearance instead of round, a sure proof that all the water is evaporated. Partly cured stems have, and will deceive even good planters, as to the right order to strike down for pressing. It is the moisture retained in the stems, that imparts itself through the leaf, as warm weather approaches. Of the different degrees of heat of which I have spoken, much depends upon the tightness of the house, and ought to be regulated by common sense observation.

Never crowd your tobacco either upon the scaffold or in the house—ten good plants is as many as ought to be hung upon a stick: if small, go to 12. When arranging in the house to fire, give a space of ten inches between, and it is best to cure in the body of the house, commencing upon the joist; when the leaf is cured, raise it up in the roof, when 4½ inches space is sufficient—if house-room be scarce, fill the body again with your next cutting—the firing of that, will cure the stems of that above. No man can cure as good tobacco in the roof as in the body of a house, a dry heat curing best. The tier next to the fire will be best, if heat be applied right—the steam passing up through so many tiers of tobacco, from which the water is constantly issuing out, before it passes the joist, the steam becomes vapor, and being confined some time before it escapes through the roof, has a deleterious effect, which, if not prevented, by a constant and sufficient supply of heat, to dry off the moisture upon the plants, house-burn ensues, when then the leaf perishes on each side of the stem. The curing of tobacco is a nice chemical process; yet it is generally entrusted to illiterate managers and ignorant negroes, neither knowing the first principles of the science. The constituent parts of tobacco, are wood. water and oil; and he who dries the wood, evaporates the water, and preserves the oil, in the best manner, is the best tobacco curer.

I am inclined to believe from observation, that most farmers keep more horned cattle, than are useful or profitable. It can scarcely be said, that we have a market for beef; an indifferent one for butter, and none for milk. Our cattle are only useful for a family supply of those articles, and for work oxen: and being very prejudicial to improvement, a subject of first importance with all of us. Would it not be good management to lessen the number, and keep the balance better? and would it not be still better to substitute your old field scrub cows, with some of the improved strain, the Durhams, Devons, or Herefords, one of which to the pail, would give as much milk, and upon the same keep, as three of your ordinary scrubs?

Permit me to invite your attention to the blooded horse, an animal every way, and every where, superior to the cold blood; possessing more strength and activity, better resolution and action, better form, wind and elegance, more docile and tractable, better under the saddle, in the carriage, on the turf, or in the plough.

CHARLES YANCEY,
President of the Buckingham Agricultural Society.

SKETCH OF THE TRANSACTIONS OF THE RECENT AGRICULTURAL CONVENTION OF NEW YORK.

To the Editor of the Farmers' Register.

Kinderhook, Saturday evening,
February 4th, 1837.

Dear Sir:—As you have been pleased to express an interest in all our proceedings that tend to the advancement of agriculture, permit me—immediately on my return home from the meeting of our Agricultural Convention, and Agricultural State Society, at Albany, while my recollections are vivid, and the emotions excited by our interesting discussions have not yet subsided—to give you an account of our doings. I have neither the minutes nor the time, to give you a detailed statement; and as I write from memory, it will not be a particular account of all that was done.

We met on Thursday, the 2d inst., at 4 P. M., in the Assembly Chamber, shortly after the adjournment of the house, which, at this season of the year, is in session. On looking around, it was extremely gratifying to see the numbers in attendance; the body of the large room was filled; the seats of the members all occupied; around the fire-places numbers thronged, while the lobby and gallery contained many listening and apparently interested spectators. As by far the greater number of delegates were strangers to each other, this want of acquaintance caused an awkwardness in our preliminary proceedings, from the fear, that in the distribution of the offices of the convention and the appointment of committees, each portion of the state would not be duly represented; for we soon found that distance had been no obstacle to prevent the attendance of delegates, as many had come from one hundred to three hundred and fifty miles for that purpose. The very thought gave an interest to our acts, that gentlemen would travel so great a distance in the depth of winter, to to be present at the meeting of, at most, two or three days of an agricultural convention.

Immediately after the organization of the house, several resolutions were offered creating the necessity of the appointment of committees to act upon them. Some of these were upon topics that could, in a few hours, be reported upon; but others involved inquiries that would lead to more thorough and minute investigation. They were all of a nature to call forth whatever of talent or knowledge we possessed; and when these reports shall be given to the world, which I think in due time they will be, it will be acknowledged that our labors have not been without beneficial results. Suffice it to say, they created distinct topics for report and discussion, and all had an important bearing upon the great and varied interests of agriculture. I will give you the leading features of a few of them.

We resolved to solicit aid from the legislature for an appropriation to be applied in awarding premiums for the exhibition of the best specimens of agricultural products in the different counties in the state;

For aid to establish our agricultural school;

For the appointment of a committee to inquire into *what* is the most useful application of the public money to be expended in the improvement of agriculture;

What progress has been made in becoming acquainted with the habits, and preventing the destruction of our wheat crops, by the "*vibrio tritici*," or wheat worm;

Unanimously resolving to recommend the work of Mr. Taylor, on agriculture, as one of the elementary books to be used in our schools;

Recommending the silk culture, and inquiring what progress has been made in it in this state the last year;

What advances have been made in the subject of the beet culture;

What late improvements have been made in our farm implements;

What are our most useful kinds of stock, and what are the best modes of improving them;

For an inquiry into the statistics of our agriculture; to know why it is that foreign wheat, rye, oats, barley and hay, have been imported the last year for the consumption of our population, we being peculiarly an agricultural people;

Requesting a communication from the geologists appointed to take a survey of this state, with such a statement of appearances as have been presented to them in their tour thus far, as far as those appearances bear upon agriculture.

I have thus briefly presented some of the topics: there were others introduced which I do not remember, but upon subjects quite as interesting. Time was given to make out elaborate reports upon many of them, and gentlemen appointed both competent and willing to enter into details. When they appear, I trust they will embody a mass of information that will serve as land-marks in our future course. Many of these, and other resolutions offered, elicited a good deal of interesting discussion, which evinced not more zeal than there was fact and talent to support it; and while many of the speeches were creditable to those who made them, the audience were both gratified and instructed with the manner and matter in which the ideas were clothed and presented.

A few specimens of domestic silk in the skein, of almost all colors, with twist, and manufactured handkerchiefs of white and variegated colors made from the worms fed upon the leaves of the native white and red mulberry, were shown. They were excellent in their kind, both in quality and workmanship. Here was proof positive that excellent silk could be made from the native mulberry; and I have long thought that our indigenous mulberry being suited to our climate, will supercede all the imported varieties. At all events, it will take a succession of years, and much loss, to acclimate the others; and until then, if we do not use the native, we cannot perfectly succeed.

Two instruments, apparently very perfect in their kind, among other things, were offered for the notice of the convention. One was a machine very simple in its structure, and apparently perfect in its operation for reeling the silk from the cocoons, twisting each filament, and forming as many of them into a thread as may be required, the threads multiplied, and all done by one operation. The convention were very much pleased with its performance, as the manufacture appeared so easily and perfectly done, as the thread was made in their presence. Depend upon it, the Americans will excel the French and Italians in a few years in the growth and manufacture of silk. There is an enterprise, an ingenuity, and a facility in our countrymen to accommodate and seize upon circumstances, which is not so apparent in other nations, and their inventive ingenuity will soon throw aside the cumbrous and complicated machinery for the manufacture of silk, which is considered so indispensable to an European.

Green's straw-cutter is an excellent article: it performs its work, as such things ought to do, well and quickly. The specimens shown, were very much approved of. Its use, you know, is to enable us to keep over the winter one fourth more of stock from the same quantity of provender, than we have heretofore done. If the principle is carried out into practice, it will give millions more of profit every year to our farming population.

A beautiful female Angora goat, imported from France, was exhibited to the members of the convention: (the male was lost on the passage.) I think the animal will do well in this climate. The one shown was in high health and condition, and its fine coat was long and thick enough to protect it against the severity of our winters. It has a warmer covering than a sheep; for next to the skin it has the fine wool of the Saxons, and growing through it, a long hair, soft as silk and twice as long as the wool of the Bakewells. If the animal thrives in this country, of which there is every probable appearance, it will be an acquisition that will add immensely to our wealth.

Of the meeting of the Agricultural Society, I have said little, as it was in a measure merged in the acts of the convention. This was very desirable, as the members of the society were few in number to those of the former. We, however, transacted our usual business, and to give the public an opportunity to hear our annual address, adjourned from the City Hall, where it was held, to the Assembly Chamber, for that purpose. The subject of the address by Dr. McNaughton was a history of agriculture. It was a very creditable and satisfactory performance—was listened to with deep attention, and a copy requested for publication. I do not know that I can enter into farther details. Our excellent agricultural journals, will, no doubt, give a more full and perfect history of the proceedings of the state society and this convention. Their readers, I am satisfied, cannot have more interesting matters spread before them; and it must be extremely gratifying to the editors of those journals, as it was to the members of the convention to have so large and respectable a delegation attend; for it was a proof that they have excited an interest in the improvement of agriculture, which was fully shown by the numbers present, and the talent elicited during the course of our proceedings.

I had previously come to the conclusion, that this would probably be the last agricultural convention necessary to be held for some time, and that it would be best to merge it for the future in the state agricultural society. But at our close, one feeling seemed to pervade the assembly—that was, that we would not meet the expectation of the public, and certainly deny ourselves great gratification as well as instruction, did we not adjourn to a future meeting. It was, therefore, unanimously resolved, that we stand adjourned to the first Thursday of February next, which God grant we may all live to see.

I remain your friend, &c., &c.,

J. P. BEEKMAN.

[What a subject for gratification and pride does the foregoing sketch furnish for a citizen of New York! and what cause for humiliation and shame, for a citizen of Virginia, in the marked contrast presented at home!

Compare the numbers and the animated zeal—the labors and the expected results—of the recent and previous Agricultural Convention in Albany, with the thin ranks, and feeble action, of the one held in Richmond last winter, and the attempt, totally abortive, to hold another there last month!

In New York, one agricultural publication of Virginia—the translation of Puvis' Essay on Lime, prepared for and first published in the Farmers' Register—has already been republished in a separate edition, and distributed gratuitously to the farmers of that state, by the munificence and public spirit of a single individual; and now, the convention have recommended that Taylor's Arator, a work altogether Virginian, shall be made a text book in their elementary schools. In Virginia, the last named of these works is nearly out of print, and there has been no demand for a new edition in the last twelve years: the former, (M. Puvis' Essay,) though republished in every northern agricultural journal, in addition to the separate New York edition, (published for gratuitous distribution, at the instance and expense of James Wadsworth, esq., of Geneseo,) has been circulated in Virginia no further than in the pages of the Farmers' Register.

Further comment would be both painful and superfluous.]

ON THE CAUSES OF THE LONG-CONTINUED DECLINE, AND GREAT DEPRESSION OF AGRICULTURE IN VIRGINIA.

No. I.

Political causes—the prevalence and effects of party spirit.

To the Editor of the Farmers' Register.

I feel an earnest desire to address my brother farmers and planters, throughout the state, on the *causes of agricultural depression in Virginia;* and knowing no better way than through your widely circulating publication, I now ask your permission to do it. My letter would have been sent, as a matter of course, and without any such request; but I recollected your general interdict against political remarks, unless they were closely and obviously connected with our own interests; and therefore I deem it necessary to premise, that every sentence which I shall utter, of a political character, will be—as I most sincerely believe—in strict accordance with this pre-requisite; for they will be applied to *every* political party which ever has existed in Virginia since my recollection, and solely with a view to prove the baneful influence upon our agricultural interests of *all* political party-spirit, however popular may have been the title, or artful the disguise, under which its true nature might be concealed.* I have my preferences, like other people, in regard both to the principles and practices of *all* our parties, past and present; but in one respect, and that of the greatest importance to the general good, I think, there is no difference between them. It is in their adoption of the fundamental principle—the "*sine qua non,*" without which, (according to my sense of the term party) none could ever exist at all. This principle—than which none can be either more base or ruinous—is, *that individual conscience and judgment must be sacrificed to party dictation.* But party men contrive, in some way or other, to reconcile themselves to the practice, by another dogma equally false and pernicious, which is, that party of some sort is indispensable to preserve their country and its government, and that they *must* preserve the party which they think right, and *above all,* that *its preservation* absolutely depends upon their unanimous support of all the measures of its acknowledged leaders, whatever their individual opinions may be in regard to the certain tendency or probable effects of the measures themselves; these being matters with which their votes have nothing to do, after such measures are decided upon at head quarters. With this assurance of my sincerity, which I am perfectly confident that you, at least, will not doubt, I will prooeed with the *professed* and *real* object of this communication, (two things by the way, which are often as opposite as the faces and points of destination aimed at by the rowers of a boat—) two political and moral sins, moreover, which every individual of every party commits whenever he suffers others to control either his words or his actions, in violation of his own moral feelings and deliberate judgment.

The causes of our agricultural depression are so numerous and so nearly equiponderant, that it is quite as difficult to know where to begin as where to stop in the enumeration. Yet I have resolved to make the attempt, although, many perhaps may be inclined to accuse me of a similar folly to that of "locking the door after the steed is stolen." Be this as it may, I will hazard the effort in the confident hope, (vain as some may think it,) that there is still left among us enough of old Virginia patriotism—old Virginia energy, and love of our native homes, to encounter all our difficulties with a fixed determination to overcome them, if possible; and with full faith that *most,* if not *all* of them, may be overcome, merely by cordial exertion and untiring co-operation. If only a moiety of the few old times people yet left, and who have not entirely despaired of the commonwealth, could be roused to the undertaking, they would probably still have influence enough over the good men and true, of the rising generation to "rally them to the rescue." Most glorious and happy would be that day, should it ever come; and that it might, is certain; for the selfishness which causes men to run away from a house on fire, instead of aiding to save the inhabitants, or the instinct that drives rats from a building about to tumble down, has not yet, (thank God,) frightened away all the true sons of our good old mother Virginia. Enough of them are still left, if they will only unite, with body and soul, to prolong the life and restore the health of our common parent.

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* We mean to adhere to our rule of admitting nothing of party politics, no matter on which side—and by such course of exclusion, we have already several times given offence to partizans on both, and have been charged as being hostile sometimes to one, and sometimes to another, of the most opposite political opinions. We have even lost subscribers, not only from the opinions which we entertain, and in our private capacity assert, and mean to continue strenuously to assert—but also for its being *supposed* that we were friendly to such as in truth we are entirely opposed to. Condemnation on such conflicting grounds, is proof that this journal has deserved it on none. Still, we have always claimed for the Farmers' Register, and will continue to exercise the right, of either condemning or applauding any measures of government, that we conceive to be injurious or beneficial to agriculture.

But strong as may be the censure conveyed in the remarks of our correspondent, they do not transcend, nor even approach, the limits of political remark which we have indicated above, and frequently have stated on former occasions—because they apply to *every* party through *all time,* for more than thirty years. But it may be charged that the censure is designed to apply to the present dominant majority in our legislature, because they *have* the power to act for the benefit of agriculture, and *do not.* This is evidently true—but still we deny the inference to be correct, that the denunciation is on party grounds. For if the places of the parties were this day changed, and the present minority should acquire the power of the majority, does any one imagine that the change of power to other hands, would give more aid to agricultural improvement? *We* certainly do not; and (from the general tenor of his remarks) neither does our correspondent—and we farther would concur in applying all the censure expressed on this head, to the *outs* no less than the ins—to all minorities as well as to all majorities, in all the long time that Virginia has been a prey to the fierce contentions of party spirit.—Ed:

Where evils are not altogether overwhelming, not such as entirely to astound and paralize us, the first step is steadily to view and thoroughly to understand them. The next is, to determine that no obstacles, however formidable—no circumstances, however discouraging, shall deter us from the effort to conquer them, if we believe them to *be* conquerable; and the last should be, the immediate adoption of such means as our best judgment may suggest for their removal. In obedience, therefore, to this doctrine, (which is one, thank heaven, that no party politics can possibly nullify, or I should give it up,) I will now proceed to state and to expose, as far as I am able, the causes of decline in our agriculture; indeed, I may say, in every branch of Virginia husbandry. Of these, the most prominent by far is, the utter destitution of legislative aid, with the exception of the sort of Irish bull law—making the *waters* of the Appomattox a legal *fence;* and the old *fence-law itself,* passed, (if I mistake not,) before the organization of our federal government, which was a very apt exemplification of the old story, that the devil being called in to mend a dog's hind leg, broke it in another place! I pronounce this absence of legislative aid the most prominent cause, because it stands in such strong and deeply mortifying contrast with the patriotic policy of several of our sister states, and especially of New York, which is now reaping from that policy the richest rewards that agricultural wealth and prosperity can confer on any government which makes the great interests of agriculture, the chief object of its regard. Heretofore, as far back as I can remember, the contemptible cant, so insulting to the intelligence and patriotism of the people themselves, of "*not taking the people's money out of their pockets,*" for any thing but the unavoidable expences of their government, even though the expenditure would procure for them, in the opinions of the wisest and best among them, innumerable moral and political blessings—far too great to be estimated by dollars and cents—has served as the despicable pretext for not expending a solitary cent towards promoting that vital interest which keeps in healthful circulation, the life-blood of all the other great interests in the community. *Agriculture,* the main stay and support of the whole, has been left entirely to shift for herself; left too, by those called the guardians of the state, the zealous promoters of her prosperity and happiness. True they have always given her a vast deal of lip service, immeasurable out-pourings from slang-whangers of all grades and dimensions—lauding her to the skies, as the best—the kindest—the most bountiful of mothers—God, bless her! But beyond that, the history of their proceedings, so far as she is concerned, presents an entire blank. Had there been the least particle of sincerity in any of these *ad captandum* vaporings—these pleasant ticklings of us gudgeons,—the agriculturists of Virginia,—something for our benefit would certainly have been done. And were there, even at this time, any real friends to agriculture in our public councils, *now surely* is the season to manifest their regard by some well-matured, earnest and zealous efforts, to aid our cause by pecuniary means; for an immense sum has lately come into our public coffers, which all the legislative brains of the state have not yet, I believe, been able to determine how to use. Still, not a solitary word have I ever read in any of our newspapers, of *any* party whatever; not the faintest whisper have I yet heard from any of our guardians and protectors in favor of applying, even a single cent towards the encouragement of *that* all-important interest, to which, principally, these gentlemen owe their present political existence. Do I blame *them* for this most fatal neglect? Not at all. *We, ourselves*—and I say it in condemnation of *all* the political parties among us—elected them to make the fighting and gaining political party battles the chief object of their proceedings; for the only test by which was tried their fitness for legislation, last spring, was, to demand of them—"Are you for Van Buren, for White, or Harrison?" None, then, who have had any concern, (and who has not had *some?*) in substituting such a test for the proper one, and thereby most fatally perverting the sense of legislative duties, should for one moment, blame their representatives for fulfilling the purposes of their mission so faithfully as they have done, ever since the memorable contest between the elder Adams and Mr. Jefferson, when this most vile and pernicious practice was first systematically adopted. At this period, since it has become thoroughly established, it would be utterly useless now to inquire, who began it; for that probably would only aggravate the evil. None can deny that they do not both see and feel it most deeply; still less can they deny its disastrous effects, although each party labors to acquit itself of all blame, by imputing the whole to its antagonist; as if they believed the people such fools as not to know that no feud or quarrel whatever, can long be kept up without *both parties being to blame,* no matter which committed the first wrong. If any affirm that *I* have made our party quarrels older than they really are, will they please to name any single session of our legislature since the date I have assigned, when the members thereof did not meet like so many game cocks, fully prepared for mortal combat, and waiting only for the pitter's signal to commence the deadly fight? Do the party-combatants of the present time show any abatement of vigor in attack or defence—any intermission of reciprocal hate—any less ardor in waging their destructive warfare? The question will be immediately answered by taking up any party-newspaper you please; and I will submit to be called a defamer, if the adverse parties in our legislature are not found engaged more than half their time, in perfect obedience to the principles on which they were elected, in a war of mutual political extermination, leaving, *ad interim,* all the great interests of the state to take care of themselves, or to receive their attention too late to do any good.

It needs no wizard to point out the disastrous consequences to all interests, but especially to ours, of such an utter perversion of the true principles of representative government. These surely require, that *the good sense, the knowledge, and the virtue of the people should be represented—not their prejudices and passions ;* for when *they* govern the constituent body, the representative body must necessarily be like their masters, the slaves of similar irrational and ruinous impulses ; and the conduct of both parties will co-operate directly to defeat the very end of that species of government, called representative, which end is the good of the whole nation, whether their polity be consolidated, or federative. Another fatal effect of this state of things is, that the great qualities of moral worth, good talents highly cultivated, love of country, and devotion to all its best interests, are no longer, (as they ought to be,) made the essential, the indispensable qualifications, for our public functionaries; but the thing first sought for—the thing preferred to all others—is, a staunch, undeviating, reckless adhesion to political party. Yet the most stupid among us know perfectly well, that much the greater portion of the duties which these public agents are chosen to perform, have really nothing to do with party politics, and moreover, that they are of such a nature as imperatively to require all the wisdom, knowledge, and virtue of the nation to execute them beneficially for the national welfare: a subject, by the way, in regard to which the rank and file of no legislative body, ever yet chosen upon mere party principles, have been any better qualified to act wisely, than to make good grammars for all the dead and living languages of the world. This would be equally true, whether they were *honest* or *dishonest*, since, in both cases, they must unavoidably pin their faith upon the sleeve of others—must be knowingly or unconciously led or driven into the party-track; for they would often have to decide between questions widely differing from each other, questions of great national interest, requiring for their decision much general knowledge and experience; questions moreover, in regard to the comparative merits of which they would be nearly as ignorant as so many children. But thus it goes, in these our days, at all our elections for representatives. "*Hurrah! hurrah!!*" for the most popular idol, at such a time, in any particular county or district, effectually drowns all argument of the adverse party: because an answer all the better for its brevity, on an occasion so animating—an answer to every suggestion calculated to damp the prevalent party fervor; and often elevates to the dignity of delegate, (I cannot conscientiously say *representative*,) of said county or district, some two legged animal, called *man*, who should thank good luck for it, if he finds his way to the legislative halls of Virginia without a guide. I beg you sir, to be assured that this is no exaggeration, for the gentleman is now living who, if necessary, could prove upon oath, that, at one of the sessions of our legislature when these party battles first began, he had literally to pilot one of these legislative noodles through the simple process of presenting his credentials, and marching into that legislative hall, where he was to make himself a laughing stock during the whole session, by such memorable fooleries, that it is not uncommon to hear them recapitulated, even at this day. But so it has been, and will be forever, while political party spirit is suffered to rule the land; for when the constituents become so distempered, so deeply infected with this moral poison, as to seek nothing else but a similar infection, as the chief, the indispensable qualification in their public servants, it is next to impossible that their representatives should be in a more healthful condition than themselves. They will certainly act and react upon each other so as to perpetuate the infection with increased virulence, until, like those pestilential diseases which destroy the body natural, it inflicts death on the body politic. How indeed, should it be otherwise? For it pervades every man's home, severs the closest friendships, brings diabolical strife into all the private relations of life, immeasurably injures the morals of every community by altering and lowering the standard of fitness for all public trusts, and, limits the field of choice for public functionaries—*not* to the whole number of the party which happens to be dominant at the time—for that might not be so bad, if it composed a very large majority of the nation—but to *that portion of it only*, which, for the honor of human nature, we may hope is comparatively small in every party, who can consent to yield the clearest convictions of their understanding and consciences to party-dictation. In truth, God has never scourged any people, for their sins, with a more dreadful curse than party-spirit: for, in religion it has caused the most bloody, savage, and exterminating wars, while in politics it has produced millions of deeds so atrocious, so horrible, that the bare recital of the least of them is enough to chill the heart's blood of any human being who possesses the smallest spark of humanity. For proof of this, I need go no further back in the history of the civilized world than to that blackest, most shocking of all its pages, the French revolution! A revolution distinguished above all others for its systematic and impious attempts to banish every thing like morals and religion from the face of the earth, by the deliberate murders of millions of the wisest and best citizens of France.

Thoroughly and deeply convinced as I am, that the salvation, not only of Virginia, but of our union itself, depends upon the extinction of the party-spirit which has so long and disastrously prevailed among us, I cannot quit the subject without a few more remarks on the fatal practice of choosing our representatives solely for their political party qualifications. Suffer me then still farther to illustrate that practice and its consequences.

The great principle of popular representation, so admirable in itself, so superior to every other basis of government, if fully and faithfully carried out, becomes, when thus perverted, the most effective, the certain means of its own destruction. The name will be carefully preserved by the unprincipled destroyers, the authors of all the mischief, and the people will be more than ever flattered with the assertion of its being in full and most successful operation, more than even gulled with the vain title of *sovereigns*, while these dear friends of theirs are leading them, like so many sheep, whithersoever they please. The party people themselves having limited their choice of representatives, as I before remarked, to a much less number than the whole of their own party, by making implicit obedience to its leaders the "*sine qua non*" of their votes, rarely, if ever, are represented either by the wisest or most virtuous men, even among themselves. They act as the bark-grinders do, who always prefer blind horses for their work. Being, themselves, regardless of all other interests but those of their own party, they will choose men who are mentally blind to every thing else, in preference to men who can see, feel, and utterly scorn the degradation of such a service. It is true, that the few who are to act as leaders and drivers, must have eyes, and tolerably sharp ones too, in order to steer safely through the many tortuous defiles which the still higher powers of their party command them to pass. But all that it is necessary for their teams to know, is the voice of their teamsters; to understand how to "gee and haw" at the word of command, or the smack of the whip; and never to balk, however sorely their harness may gall—however deep may be the mud, the filth, and the stench through which they may be goaded, either by words or the lash, to pull.

Were I to count up all the months worse than wasted in this vile party work, for the last thirty-odd years, the whole time, I have no doubt, would have been amply sufficient for five or six entire sessions of our legislature, spent, as they ought to be, in the diligent, earnest, but calm and dignified discussion of the great concerns and interests of the state. But ever to expect so patriotic a course will be utterly vain, unless we can prevail on ourselves to change entirely the standard by which we test the qualifications essential to the wise and faithful discharge of all public duties. We agriculturists are more especially interested in this change than any other class: for it is perfectly demonstrable, that to the want of it must be ascribed much of our present depression—much of that utter neglect of our interest which has marked the legislation of Virginia from my earliest recollection. This neglect, I fear, we are destined to suffer unto death—for fools that we are, suicidal fools! we never *yet* have co-operated as a class; and the chance of our ever doing so hereafter may readily be calculated by any of those who noticed, (if, indeed, *any* have,) the utter failure of the late attempt to get up an agricultural convention. But until we *do co-operate as a class*, I deem it absolutely certain that our relative and legitimate power of contributing to the general welfare, and the extent to which that welfare depends upon our condition, will never be either felt or recognized as a proper subject of consideration by those *miscalled* our representatives. Compared with other classes, we still have the numerical majority, still possess a larger property within the state than any other class, and can still bring to the polls a larger number of voters. What obstacle therefore, but the most asinine stupidity, or destructive neglect of our own best interests, hinders us from exerting over the legislation of the state, *that* influence to which we have such just and indisputable claims—an influence moreover, which could not possibly be exercised in favor of our own occupation, without benefiting every other in the community? Then, why not exert it at once, *by determining unanimously*, to vote for no man, at our spring elections, who will not pledge himself to make some certain and earnest effort in favor of agriculture? Let *this* be done—let us establish *this* as one of our indispensable tests in choosing our representatives, and death itself is not more certain than would be an ample legislative aid as we would ask.

(*To be continued.*)

A NEW SEEDLING VINE.

The *Journal of Science and Art*, vol. xxvii. p. 229., contains the following notice: "A seedling vine, raised by M. Van Mons, at Brussels, produces fruit as large as a green-gage plum, which, at the latest, ripens in the first fortnight of August, and never fails." I should be glad to know if this grape can be procured in England.—*J. B. W., Sept.* 15, 1836.—*Loudon's Gard. Mag.*

POTASH FROM BEET-ROOT.

The beet-root, says a French paper, is about to acquire an additional title to the attention of agriculturists, by the new produce which, besides molasses and sugar, it is now found can be extracted from it. One of these productions, potash, will be, like sugar, the rival of an exotic commodity. M. Dubrunfont has been the first to discover the means of advantageously extracting this substance from the residuum left after the distillation of molasses, and which has hitherto been thrown away, after the separation of its alcohol. To give some idea of the importance of this new source of national wealth, it will be sufficient to say that the quantity of potash yielded by M. Dubrunfont's process is equal to one sixth of the quantity of sugar extracted from the beet-root; thus admitting the the fact that, where 80,000,000 lb. of indigenous sugar are annually produced, we may expect to obtain from the primary materials 14,000,000 lb. of a saline substance, equal in all respects to the best potash imported; besides alcohol and other productions. At the present rate of prices, the value of this quantity will be about eight or nine millions of francs; and these facts furnish an additional argument for the protection of our indigenous sugar against foreign competition. (*Morning Chronicle*, Nov. 1. 1836.) I have since learned that a kind of coffee is made by the French from some part of the beet-root, after the sugar has been extracted, which is said to be equal, if not superior, to coffee from chicory. Now, as there is an establishment at Limehouse for extracting sugar from the beet, I should be greatly obliged to any of your readers who would inform me, 1st, Whether this manufactory answers as far as sugar is concerned? 2dly, Whether potash is extracted from the refuse? 3dly, Whether coffee is made of it? and, 4thly, To what other purpose is the refuse applied? The reason I ask is, that I intend trying to extract sugar from the root on a small scale, for the use of my own family, and for teaching my pupils. I give you my address below for your own use; but wish, if you publish this article, that it should be signed—*A. D. G. Near Stockport, Nov.* 2, 1836.—*Loudon's Gard. Mag.*

From the Genesee Farmer.

HAY FROM SCOTLAND.

An English paper says—"It forms a curious item of the agricultural commerce of this country, that we are now exporting hay to America. A vessel is about to sail with a cargo of 10,000 stone of hay from Aberdeen, and a larger will follow from Clyde. The hay is pressed by the hydraulic press, and the bulk has been thus reduced [sufficiently] for transportation."

The hay thus spoken of has reached this country and finds a quick sale at from 22 to 25 dollars a ton, principally at Boston. If Great Britain, with nearly three times as many horses, cattle and sheep, in proportion to its population, as are owned in the United States, is not only able to provide for their wants, but furnish large supplies of hay for exportation, it proves that England is far ahead of us in productive farming, and that we ought to mend our agriculture at once. It is the *cultivation of roots*, that enables English farmers to keep so many cattle, and spare us their surplus hay; and American farmers must follow the example, or fail of their profits and their success. It is surprising with what tenacity our farmers cling to old usages; and persist in mowing ten acres of land to get fifteen or twenty tons of hay, when two acres of roots will furnish more and far superior food. There is hardly a crop produced, more certain than the ruta baga, unless attempted on soils decidedly unfavorable, and their excellence has been fully tested for feeding and fattening cattle and sheep; yet not one half our farmers can be induced to attempt the culture of the root. It is satisfactory to know, however, that the root culture is gaining ground; and that those who have tried the turnip, will not readily relinquish its use and benefits.

A "JOIN-BEEF" PAPER.

To the Editor of the Farmers' Register.

Scotland Neck, N. C. 20th Jan. 1837.

Below, you will find what is called in this neighborhood, a "join-beef paper." It has been found very convenient to the farmers in this neighborhood, and will be so to all, where not situated near to a market. As a proof of its convenience, I have now in my possession papers which will show it to have been regularly kept up for the last sixty years in this neighborhood. I have never heard of it in any other place but here. If you think its publication in the Farmer's Register will contribute any thing to the convenience of your readers, you can publish it—otherwise you can destroy it.

A	Loin. 32	Leg.	Brisket.	Rack.	Loin.	Leg.	Brisket.	Rack.
B	Leg. 28	Loin.	Rack.	Brisket.	Leg.	Loin.	Rack.	Brisket.
C	Brisket. 29	Rack.	Loin.	Leg.	Brisket.	Rack.	Loin.	Leg.
D	Rack. 31	Brisket.	Leg.	Loin.	Rack.	Brisket.	Leg.	Loin.
E	Loin. 28	Leg.	Brisket.	Rack.	Loin.	Leg.	Brisket.	Rack.
F	Leg. 29	Loin.	Rack.	Brisket.	Leg.	Loin.	Rack.	Brisket.
G	Brisket. 30	Rack.	Loin.	Leg.	Brisket.	Rack.	Loin.	Leg.
H	Rack. 28	Brisket.	Leg.	Loin.	Rack.	Brisket.	Leg.	Loin.

The first column, A, B, C, &c. represents the "joiners'" names: the second represents A, the first killer of beef, who puts the weights under each piece that he sends to the other joiners. When B kills, he puts the weight in second column, and each joiner follows on in the same way until the join finishes. The join can be once or twice a week. If for once a week, the paper will last eight weeks—if twice a week, only four weeks. In our neighborhood, we join twice a week. The beeves weigh from fifty to sixty, per quarter, as this size is most convenient to most farmers here. If one kills a beef rather small this year, he generally kills a larger next; or if he kills one too large, he kills a smaller one next time. The weights are put down more for the purpose of keeping them from sending to the wrong person than any thing else. By examining the paper you will see that each one returns the same piece sent him by his neighbor.

WM. R. SMITH, senr.

WASHINGTON'S VIEWS OF WAR AND AGRICULTURE.

We find the following sentiments in a letter written to Arthur Young, Esq., of Great Britain, some years after the war; its date is Mount Vernon, Dec. 4, 1788:

"The more I am acquainted with agricultural affairs, the better I am pleased with them; insomuch that I can no where find so great satisfaction as in those innocent and useful pursuits. In indulging these feelings, I am led to reflect how much more delightful to an undebauched mind, is the task of making improvements on the earth, than all the vain-glory which can be acquired from ravaging it, by the most uninterrupted career of conquests. The design of this observation is only to show how much, as a member of human society, I feel myself obliged by your labors to render respectable and advantageous, an employment which is more congenial to the natural dispositions of mankind than any other."

In another letter, written about the same time, he says:

"How pitiful, in the eye of reason and religion, is that false ambition which desolates the world with fire and sword for the purpose of conquest and fame, compared to the milder virtues of making our neighbors and our fellow-men as happy as their frail conditions and perishable natures will permit them to be."

From the Petersburg Intelligencer.

RALEIGH AND GASTON RAIL ROAD.

It gives us much satisfaction to learn that this work is in rapid progress, and bids fair to be completed with as much despatch as any that has preceded it.

One-half of the whole line of the road, from Gaston to Chalk Level, a distance of about 45 miles had been located and put under contract. Between 600 and 700 hundred hands are at work, and although only five weeks have elapsed since a commencement was made, the extent of excavation and embankment is already considerable.

Exclusive of several contractors who have heretofore been regularly engaged in this occupation, some of the most wealthy and respectable planters residing in that part of the country have taken contracts, and are making excavations and embankments instead of tobacco and cotton—looking forward to the benefit which they will derive in the transportation of future crops to market, when the rail road shall be completed, which will no doubt precede the maturity of their next year's crop. The owners of land, on and near the line of the road, find a new resource in the market which it affords for their timber, heretofore of little or no value—for provisions of all sorts, and for any superfluous labor from the business of farming. Most of the foundations of the piers and abutments for the bridge across Roanoke are above high water mark, and that great work will be speedily executed.

The road has been located as far as Tar River, and will soon be completed to Raleigh. Persons are in readiness to take contracts on this half of the road, and there is no doubt that the entire line will be let, very soon after the requisite preparations are made by the engineers.

A spirit of activity, we understand, prevails along the whole extent of the whole country through which the road is to pass, and all look forward with confidence to the benefits which it will confer.

The legislature of North Carolina has granted a charter for a rail road from Raleigh to the South Carolina line, in the direction to Columbia; and books for subscription to the stock will be opened in the course of a few weeks.

ON THE USE OF THE CULTIVATOR—IMPROVEMENT OF LAND &C.

To the Editor of the Farmers' Register.

White Plains, Norfolk Co., Va.
January 30, 1837.

Inclosed I have remitted the amount of my subscription for the third and fourth volumes of the Register, though I can but "*plead guilty*" for being so tardy in attending to it; yet I hope it will not be the less acceptable, though at a "*late hour.*" And by the by, as snow has driven me "*in doors,*" and there is much blank paper to spare, I will say a word or two about our farmers and farming generally in this county, though I shall despair of saying much in their favor.

I can but congratulate you on the general good that has resulted from reading your paper, and had hopes that it might be found on every planter's chimney-piece in the county; but alas! emigration is here raging with all the strength of fanaticism, and nothing else can be talked of but selling estates, at a great sacrifice, and "*packing off*" for the "*far west.*" This of course has banished all agricultural books, tracts, periodicals and the like from their libraries, and they dream of nothing, day or night but "Aladdin's magic lamp of Arabian story," or some such thing, that, by a look or a wish, will coin every thing into gold. So infectious, indeed, has the mania become, that no astonishment is produced on seeing our wealthiest neighbors leave, and plunge into the "adventurous ocean" of emigration. Not content with doing well, when such "golden visions" of full pockets and "groaning coffers," haunt the midnight pillow, by reaching forth to pluck, they "unmoor their anchor" and launch away in bright expectation of doing better, like the man who killed his goose that laid a golden egg every day. But whether these bright visions be correct or not, is it not a pity that the industry and wealth, the very "bone and sinew" of our venerable old commonwealth should thus be leaving it? It seems to me almost unfilial and unpatriotic, after having drained from her veins almost the last drop of blood, in the moment of destitution and need, when her pensive and tottering pace calls loudly apon all her sons for support; for none can deny but that party feeling, "like a canker worm in the bud," is paralyzing all her resources, and kicking her down hill, as fast as a retrograde motion will allow her to travel. But in this, as well as every thing else, the old adage is verified, "what is every body's business, is no body's," and instead of calling her legal guardians to an account for her condition, truant like, we run away, and leave her to be the "whip-top of fortune," to be whipt round and round by every "do-nothing body" that can lay hands on the lash. But I'll turn to the plough, as I understand better what to do with it than with the reins of government.

Agriculture in this county is slowly advancing, the "scales of ignorance" have fallen from many of our eyes, and we begin to doubt whether the "old beaten track" is best. The cultivator is becoming more in use among us, in lieu of the plough, and we think it a valuable improvement in our husbandry, as our corn crop can be tilled with less than one-half the labor. By the by, I 'll give you the result of an experiment, made the last season, to ascertain the difference between the plough and cultivator, in the cultivation of corn. Though the experiment was not in every respect a fair one, for the measuring tub was not used, yet it was sufficiently so to satisfy all who saw the standing crop, that nothing was lost by the use of the cultivator. Two lots of land were selected, of nearly equal fertility, (the difference, if there was any, was in favor of the cultivator,) and planted at the usual time, and both received the same number of workings over, with the plough and cultivator, also the same number of hand-hoeings. The season was certainly a bad one for the cultivator, for with it the surface is always kept level, and notwithstanding the heavy inundating rains, the lot on which the cultivator was used, produced one-third the most; but the difference in product I am willing to credit to the superior fertility of the land, rather than to the cultivator. As a labor-saving implement, there should not be two opinions, for the work of one corn-row may be done by twice running, or two 'bouts, while the plough requires four, if not five, 'bouts; thus it is one half the labor, at least, is saved, and if the work is well done, and adapted to the growing crop, a great object is accomplished in the cultivation of the most useful of all grains, to wit, Indian corn.

By the way, I had like to forgot my *experiment crop* for last year, that I think will say much for the cultivator. The lot on which it was made, contained six acres, enriched principally by clover, lime, and plaster, one acre of which was "bottom land," originally fertile, but the heavy inundating rains compelled me to abandon it, when but five acres were left. The corn was planted in drills on a level surface, in rows five feet apart, and as thick as it could well grow, say from 12 to 18 inches. When the corn came up, the new-ground coulter was used by running as near as possible, and as deep as one horse could pull it. The remainder of the work was done with the cultivator, except three hand-hoeings which was given it—the quantity gathered was ninety barrels. This experiment was made with a two-fold object, first to ascertain the "speed" of the land, and secondly to convince some of my incredulous neighbors, that land here can be made to produce as much, of any crop that the climate is adapted to, as the lands of the "far west;" and that we have only to set to work, the right way, to improve it.

My mode of improving land, I think, differs from the majority of my agricultural brethren; nor do I pretend to say that it is better—only that it is the most convenient, and offers a surer guarantee for a certain remuneration, with the least labor. My manor farm consists of about four hundred acres of arable land. A division fence makes two fields of two hundred acres each. One of these fields is cultivated in corn in alternate rotation, whilst the other is suffered to lie out, without the taxation of either tooth or hoof. My manure annually, which generally amounts to from one to two thousand good cart loads, is generally applied to from 12 to 18 acres of land, spread on the surface after fallowing, and made rich at once, and then set in corn, to prepare the soil for clover. After clover, with any thing like "fair play," the land will continue to progress in improvement. By this system, in fifteen years, should my quantity of manure not increase, I shall be enabled to manure the four hundred acres over, at the rate of one hundred cart loads per acre, and my crops increase annually, having already about fifty acres completed.

Our crops, the last season, both of corn and oats, in this and the adjoining county, Princess Anne, were unusually heavy, and we only need "active hands," and "understanding hearts" to do nearly as well as we deserve. True, we have to work hard for all we make; but where is the land or country where the farmer is not compelled to live "by the sweat of his brow?" If our state, or its legislature, would but show our profession "fair play," protect our property and our rights, and thereby prove to us that we were recognized and honored as a profession, as one of the principal pillars of the country's prosperity, by hearkening to our petitions, and honoring our representatives—then no "sod" on earth would be as fondly loved, as that of the old dominion. I do not, Mr. Editor, often complain, for well I know complaints are often ill-timed; but in this case every farmer should "cry aloud and spare not,"—should thunder forth their wrongs and grievances, "with the voice of a trumpet," nor cease till a hearing was granted us. If, indeed, it would oppress any, by doing us justice, then would we be silent; but when no profession will be harmed, but rather, all be benefited, and the vital interest of the state improved, it seems to me to be the most reasonable request that could be made—yea farther, our duty to make it, and their imperious duty to attend to it. But here I owe an apology to my friends for not meeting them at the last agricultural convention: however offering a legal excuse, "having married a wife," I hope for pardon. Notwithstanding, so delicious as is the "honey moon," I should have attended, but for the obstruction of the river by ice so as to prevent navigation. But had I attended, so imbecile would have been any aid I could have afforded, that I am sure my seat in the chimney corner, at home, was filled with better grace than it could have been in your convention.

AG. S. FOREMAN.

FLORIDA COFFEE—POTATOES.

To the Editor of the Farmers' Register.

Fayetteville, N. C., February 14, 1837.

* * * * *

I promised in a former communication to let you know the result of my experiment with Florida coffee. The imposition practised upon the public, recommending that offensive weed, was too great to be referred to in good temper. Suffice it to say, that the loss of the $2, paid for the pound of seed, the use of an acre of land, and the expense of cultivation, were not so mortifying to my pride, as being made the dupe of a knave.

Do not omit sending me the missing numbers of the Register: although no farmer, I have derived too much pleasure and information from that valuable publication to lose any part of it.

I have cultivated sweet and Irish potatoes for many years, but I am candid in saying, that the information I have obtained from reading the Register has enabled me to double my small crops of these articles.

STRAWBERRY CULTURE. DISTANCE OF CORN —EXPERIMENTS WITH MARL AND GYPSUM.

To the Editor of the Farmers' Register.

Powhatan Hill, 10th Feb., 1837.

The last No. of the Register, just received, suggests some reflections upon which you may place any or no value, as you please. In the first place, it is recommended in an article extracted from the Village Record, on the cultivation of strawberries, to mow the vines and cover the bed with rotten wood. I have pursued a different course with mine for several years, and experience recommends my practice. My beds are weeded once a year only—in the fall—the plants are at that time thinned to the usual planting distance: after the beds are cleaned thoroughly, they are covered with either cut straw or chaff—the first is best, as the chaff generally contains seeds of wheat, cheat or weeds. The plants are thus kept warm through the winter—they spring up through the straw early in the spring with great vigor. When the fruit ripens, the straw protects it from the dirt—it smothers weeds; and by its decay before the autumn, it furnishes sufficient manure to enrich the beds. This is the mode of culture practised by a gentleman living near Baltimore, who supplies that market with many thousand quarts during the delicious strawberry season.

In the second place, I desire to recommend "Six and Two" to plant his corn, if he prefers the drill system, (in which preference my opinion coincides with his,) five feet by two in good land—five feet by two and a half, or by three, in thin land. That writer prefers six feet by two, because, "the greater the distance one way, the less your corn will be ridged by ploughing; and, therefore, the more dirt you can throw immediately around it without injury." I prevent my five feet beds from being ridged too high by running upon the beds, soon after the corn comes up, a large two-horse harrow, which I term a *cultivator-harrow*, the horses walking on each side of the corn, which passes between the two foremost teeth.* The hindmost part of the harrow is five feet wide, and consequently reaches the water furrow on each side of the bed. The ridge is thus drawn down to a sufficient level: the corn is worked so well, that an observer would presume that it had been weeded—the hoe work is, therefore, facilitated greatly, and the corn worked more rapidly than it would have been in the usual mode. Unless the land is very stiff, there is no necessity for *siding* the corn with the plough in the first instance. After the corn is too high for the *cultivator-harrow* to pass over it, the land is easily kept clean, and the corn sufficiently worked by the common cultivator or harrow. At the usual time of *laying by*, as it is termed, you may "throw as much dirt as you please around it;" but not "without injury," if we adopt the opinion of the most judicious northern farmers, who contend that the dirt ought never to be thrown around the corn, the growth of which is thus checked until the new roots put out and grow in the fresh soil. I am disposed to adopt this opinion, and shall try the practice with a portion of my coming crop. My experience, limited it is true, favors the *level* system of cultivating corn; but I have not yet given it so full and satisfactory a trial as to venture to recommend it. I do not flatter myself that I have assigned sufficient reason to change the views of "Six and Two." I am convinced by trial, that 5 by 2 is not too close in strong land: there are more stalks, of course, than in beds of 6 by 2; 6 by 2 is too close in thin land; 5 by 3 would bear the same number of stalks as 6 by 2 1-2: beds six feet wide require one furrow more, at the least, with the plough, in breaking up the land: the corn, when well grown, does not shade the land, and consequently preserve the moisture so well in wide as in narrow beds.

I will now mention an experiment made by me last year. I planted a part of a cut of corn about 5 feet by 2, single stalk, and another part of the same cut 5 feet by 3, double stalk. Several gentlemen, whose attention I directed to the trial during the summer, did not hesitate to express the opinion, that the single corn would produce the most. When the corn was hauled from the field, I had the product measured by the cart bodies, and there was no sensible difference in the yield. The number of ears from the latter, was, of course, greater; but they were much smaller—more trouble was imposed in gathering and shucking; consequently, the advantage was on the side of the single stalk, which was somewhat diminished, however, by the necessity of weeding a larger number of hills.

I hauled some marl on my corn land last winter. I put some on a very poor spot, without any putrescent manure: the corn was improved by it most sensibly—so much so, that the negroes, on cutting the corn to sow the land in wheat, stopped of their own accord, (and you know, they are the least observant of the human species,) at the row where the marl stopped. I want no better proof of its efficacy, and am using it freely, and shall do so as long as I am a farmer.

I have imposed more on your patience than I intended; but before I close, permit me to recommend some of your experimenting readers to try the efficacy of plaster of Paris upon the Irish potato. Sprinkle the cuts heavily with it before the dirt is drawn over them. I think that I owe a large increase of my crop for two years to the plaster.

ED. T. TAYLOE.

From the Silk Culturist.

THE NATIVE, OR COMMON RED MULBERRY AS FOOD FOR SILKWORMS.

Lancaster, Ohio, Dec. 7th, 1836.

F. G. Comstock, Esq.

Sir:—Having learned from the "Culturist" and other authorities, that seven or eight pounds of cocoons are usually required to produce a pound of reeled silk, I can hardly hope to be credited when I state the result of an experiment or two that I lately made with a few cocoons of worms that were fed on leaves of the *morus rubra*,* or common red mulberry of our western forests.

---

* A little boy follows the cultivator-harrow with a small rake to remove the clods which may cover some of the corn.

The cocoons were deprived of their loose floss, and the crysalids were perfectly dry. I weighed cocoons to the amount of 215 grains, and causing them to be reeled I obtained 75 grains of silk, equivalent, very nearly to 35 per cent. Observing that several grains were lost through unskilful management, the reeler being altogether inexperienced in the business, I determined to repeat the experiment, in order to ascertain, if possible, the maximum of silk that could be reeled from a given quantity of cocoons. I then carefully weighed just 100 grains of the cocoons, which yielded 39 grains of reeled silk, besides a few atoms of floss amounting perhaps to one grain. It would thus appear that these cocoons contained about 40 per cent. of silk. What is the per centum of silk usually contained in dry cocoons? and what proportion of the silk contained by the cocoons is extracted in the ordinary process of reeling?

In determining the value of the red mulberry, as a source of food for the silk worm, we should inquire—

1st. What is the quality of the silk it produces?

2ndly. Is the red American mulberry, a tree of as rapid growth as the white Italian, with which we would naturally compare it?

3rdly. Does the former produce as abundant a foliage as the latter?

4thly. Is the foliage of the American tree as nutritious as that of the Italian—and do worms fed upon the former produce as good cocoons as those fed upon the latter?

1. With regard to the quality of the silk obtained in my experiments, I do not profess to be a competent judge; but I certainly cannot conceive that any thing of the silk kind could excel it in fineness and brilliancy. My judgment, however, is not needed to establish the character of the silk produced from the American mulberry. We are already in possession of an overwhelming mass of evidence tending to prove most decisively, that this silk will bear comparison with the *best* that can be produced from any other source. Your readers may find some of this evidence in articles on the 92d, 94th, 96th, 105th, 109th, 138th, 155th and 156th pages of the "Silk Culturist," and also in a document published by Congress in 1828, and containing "information in relation to the growth and manufacture of silk."

In addition to these testimonials, I would present the evidence of Mr. D'Homergue, a French silk manufacturer, who pronounced a sample of reeled silk which had been produced from the red mulberry to be "indeed beautiful"—"not surpassed by any that he had ever seen," and "equal in firmness to any other."

I could also demonstrate by citing several authorities, that sewing silk produced from our native mulberry is *stronger* than the European article.

2. With regard to the second query I would premise that it is hardly fair to compare a plant in a state of nature with one that has enjoyed the advantages of cultivation. Notwithstanding, however, the disadvantage that exists on the side of the American mulberry, it has the appearance of being the more thrifty tree, if I might be permitted to judge from a few specimens that I have seen of the Italian tree.

3. If there is any difference in regard to the quantity of foliage yielded by each, I believe that the difference is in favor of the American tree. At least it is certain that the red mulberry has the important advantage of producing a much larger leaf than the other.

4. That the leaves of the American mulberry are as nutritious as those of the Italian, and that a given quantity of the former will produce as much silk as the same quantity of the latter, there can be no doubt. And all observers concur in remarking that the cocoons preduced from each are equally fine. Mr. Jesse Waltz of this place informed me that he and his neighbor, Gen. P. Beecher, each fed a few silk worms in the same season, Mr. Waltz using the common wild mulberry, while Gen. Beecher used the Italian; and that upon comparing the cocoons, there was not the least perceptible difference. The cocoons were reeled, and upon a second comparison no difference in the quality of the silk could be discovered.

I would now inquire, why in the name of common sense, persons in the west who wish to engage in the silk culture should wait on the tardy growth of the Italian mulberry from the seed, when the forests every where around them abound with a tree altogether equal, if not superior to it. In almost every neighborhood a considerable cocoonery might be profitably supplied from trees planted by the hand of nature. But as these trees are generally somewhat dispersed, and as the climbing of large trees is inconvenient, I would recommend the plan of propagating the red mulberry by means of cuttings set hedgewise. By stocking the requisite quantity of ground with thrifty cuttings, a person might, on the second year, have any amount of foliage that he might desire.

One of your correspondents estimates that an acre of ground set with cuttings of the Chinese mulberry will on the first year yield 10,000 pounds of leaves. It is allowed by some writers that 100 pounds of foliage will produce one pound of silk. If this supposition is correct, then the produce of one acre on the first year would be 100 pounds of silk, worth, when reeled, $500. I feel confident that on the second year a result equal to this might be obtained from our native mulberry. I am not sure that the foliage might not be profitably used even on the first year.

Permit me to suggest a theory in regard to the Chinese mulberry. I am persuaded that it is a creature of cultivation. It is propagated altogether by layers and cuttings, instead of seed; and the stems are cut down every year to the ground in order to obtain an annual crop of fresh shoots. It is to these circumstances of its propagation and culture that the luxuriance of its growth, and the largeness and tenderness of its leaves, are owing. Hence will appear the reason why a similar plant is not obtained when attempts are made to propagate it from the seed. The plant obtained from the seed is a *natural* production; while that produced by other means is an artificial one.* I belieave that I can originate a new kind of *morus multicaulis* quite as good as the old, from the red mulberry. I design to make the experiment next summer. For a commencement, I can obtain from trees from which some of the larger branches had been accidentally broken off, a considerable number of shoots five and a half feet in length, the growth of last summer—and I can also get a few sprouts of a similar growth and age with the roots attached.

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* This is the true botanical appellation. Some have improperly called it *Morus nigra*, or black mulberry. The black mulberry is not a native of North America.

Yours respectfully,
JOHN WILLIAMS.

COMMERCIAL REPORT.

Less business than usual has been transacted in Virginia during the present winter. Supplies of produce were small—foreign markets unfavorable—the results of previous transactions generally losing—and withal, money scarce.

The community is still kept in suspense as to the increase of banking capital within this commonwealth; while the influx of bank notes from adjoining states now furnishes a considerable portion of the circulating medium in some parts of the country, and a depreciated one in others. We thus endure the evils, without deriving the benefits attendant on such institutions, and offer inducements to our neighbors to carry to excess, what we refuse to ourselves in moderation.

The quotations of produce have not varied much since the commencement of the year. The general range of prices is, for tobacco $3 to $7; cotton, 13 to 16c.; wheat, $1 75 to $2 15; flour, $10½ to $12; corn, $4 50 to $4 75. Importations of foreign grain into our northern ports continue to be large and profitable. Flax seed has arrived from India. Charleston is receiving supplies of hay from France, and among the commodities recently imported from that country, sugar (not of the beet,) may be enumerated. This, however, is not more strange than the importation into James river, of coal from Great Britain and Nova Scotia.

British ship owners carry on a thriving trade from our ports in timber and other bulky articles, which acquire the character of colonial produce by a slight deviation from a direct voyage, and are admitted into Great Britain free of duty; while similar importations by American vessels are virtually prohibited. The effect of this system requires no illustration.

The pressure for money which has so long prevailed in our large cities, continues with little abatement. Severe as this has been in N. York and Philadelphia, it is a remarkable fact, and highly creditable to the mercantile community, that scarcely any failures have taken place in those cities. The excessive rate of 1 1-2 per cent per month interest is still current. Real estate has not there declined in price, and all articles of subsistence are high. A recent attempt in New York to reduce the price, by diminishing the quantity, did not succeed; and it is to be hoped that the mob will not repeat the experiment.

In Mobile, the factors, or commission merchants for the sale of cotton for the planters, have suffered great inconvenience, and in many instances been ruined by coming under advances for crops, the receipt of which was, in the first instance, retarded by low water, and subsequently by the want of confidence created by failures among the merchants to which this very delay gave rise. Enormous speculations in real estate probably contributed to produce similar disasters. The effect of heavy investments made by planters in lands and negroes at high prices, on long credit, will probably be developed when the price of cotton shall decline; which, from present appearances, is not a remote contingency. Such a reverse in the prosperity of that country, however, cannot be of long duration, when the increasing population and productiveness of the western states is considered. Internal exchanges continue unregulated, but the rates are not so excessive as they were. The current of specie continues to and fro, benefiting those only who are employed in its transportation.

February 24. X.

MORUS MULTICAULIS NOT PRODUCED FROM ITS OWN SEEDS.

The following statement agrees with what we were first to inform our countrymen of, in this journal, more than two years ago, on the authority of an experiment reported in the *Annales de l'Agriculture Francaise*, that the *morus multicaulis* had been found to be merely a variety of white mulberry, and did not reproduce its own kind by seeds. This very important fact (if true) we have again and again endeavored to impress on the agricultural public—but apparently to no puopose. The anxiety to obtain seeds of the *morus multicaulis* has been so great, that encouragement has been thereby afforded to extensive frauds, by the seller substituting seeds of another kind. But even if the seeds had been what they were supposed to be, if from trees of the true *multicaulis*, the failure and disappointment would probably have been as great.

But though believing that the seeds of this plant are not be relied on for reproducing their own kind, we are not inclined in any case to trust to reported opinions, or authority that is the least doubful, when the facts can be tested by accurate experiment. We have the means of making such an experiment, in seeds of the *morus multicaulis* taken last summer from trees which grew within the enclosure of the high walls which surround the Penitentiary of Virginia, and near which no other kind of mulberry grew, to affect the seeds by a mixture of the fecundating farina. If *these seeds* will not produce the *morus multicaulis*, it may be thereafter safely pronounced, that seeds are not only not to be relied on to produce this kind, but that the result of reproduction of the like kind rarely, if ever, occurs.

"This mulberry, it is now well ascertained, is a hybrid variety, and not a true species—the seed will not produce its like. We have been informed by a gentleman who purchased a plant, three or four years since, of some nurserymen of our vicinity, that with considerable care he raised quite a number of seeds. The plant was taken up upon the appearance of severe weather, and placed in a celler where the frost did not penetrate—the roots were slightly covered with earth. Pursuing this course two succeeding winters, it attained the size of a large shrub with numerous ramifying branches—the third season it produced seeds. No other species or variety grew in the vicinity of the plant, and the blossoms consequently could not have been fertilized but by its own pollen. These seeds were carefully sown, and the result was a number of seedling plants, with foliage of all sizes and textures, from the common white, to that of the parent. No better proof is needed to confirm what we now state, and have heretofore stated."—*American Gardener's Magazine.*

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* If seed from the artificial tree be used, the plant re-appears in its original form.

THE INDEX TO VOL. IV.

It has heretofore been our course not to delay the last No. of a volume for the issue of the index, (which must necessarily be completed and printed after the close of the volume,) but to send the index to every subscriber with the next No. But so many of these loose sheets have been lost, either after or before their being delivered from the post-offices, and so numerous and long continued have been the consequent demand for duplicates, and even sometimes triplicates copies, that, in self-defence, another plan of issuing must be adopted. For this purpose, the next and last No. of vol. 4, will be delayed (if necessary,) after the first of April, the day when it should in due course be issued, until the index for vol. 4 can be printed and stitched with it. Then the one cannot fail, without the other, to reach every subscriber.

It is believed that almost every subscriber to the Register *intends* to have his numbers bound in volumes, and attempts to preserve them for that purpose. But so little care is generally used in preservation, and so much delay permitted before the binding, that the very desire to preserve, serves to destroy for us numerous volumes, by applications for lost or mislaid numbers—which applications we have never refused, if the copies asked for were on hand—and they have been always furnished gratuitously, unless in some few cases where a single applicant asked for half a volume or more. It would save much loss to all parties, if all subscribers who wish to preserve their numbers complete, would not delay the binding much beyond the completion of each volume. If this had been done from the begining, we should not now be unable to buy back copies of vol. 1 at the higher price, which is offered, ($6,) than the subscribers paid for them. And on the other hand, if none had cared or desired to preserve their files perfect, we should not have had destroyed, and lost the value of some hundreds of volumes in the course of four years' publication, by the demand for duplicates of lost and mislaid numbers.

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Portraits of Animals.

ADVERTISEMENTS of valuable horses and horned cattle may be executed at the office of the Farmers' Register, accompanied by superior wood engravings exhibiting correctly the likeness of the animals, if timely application is made, accompanied by a correct drawing for the use of the engraver.

A specimen is offered on this page, and in the foregoing advertisement and picture of the horse Shakspeare. This new style of advertising, and representing correctly the forms of valuable animals, will cause but little additional cost to the advertiser.

March 1, 1836.

CYLINDRICAL STRAW CUTTER.

THE subscribers offer for sale Sinclair & Moore's improved Cylindrical Straw Cutters, of various sizes, adapted to horse or manual power.

The very important improvements made by Messrs. Sinclair & Moore on these machines, giving them extra strength and durability, have rendered them the most perfect and effective Straw Cutter in this country; they are so constructed as to be capable of cutting cornstalks and fodder, tangled hay, &c. with great ease, thus enabling the farmer to realize a profit by feeding to his cattle his corn fodder, which would otherwise in a great measure be lost. These machines are self feeders, the knives of spiral form, and act on a steel bed, in such a manner as to cut with great ease and despatch. The sizes are as follow, viz.

11 INCH BOX, suited to manual power, and capable of cutting 600 bushels of straw per day, being quite sufficient for the usual wants of farmers, price	$30 00
Extra knives for do. per sett,	4 00
14 INCH BOX, suited to manual or horse power: this size will cut 1000 bushels of straw per day, price	45 00
Extra knives for do. per sett,	5 00
20 INCH BOX, suited to horse or steam power, capable of cutting 125 bushels of straw per hour, price	75 00
Extra knives per sett,	8 00

☞ The above named machines are all made with endless leather, moveable bottoms; boxes with stationary bottoms are only made to order, being inferior, and a very trifle less in cost.

ALSO FOR SALE,

CORN SHELLERS, with vertical cast iron wheels; will shell 25 or 30 bushels per hour, price	20 00
Ditto Do. a powerful machine, adapted to horse power, and capable of shelling 80 a 100 bushels per hour, price	40 00
1800 PLOUGHS, of various patterns and sizes, including those in general use and most approved, price	4 50 a 20 00
WHEAT FANS, common Dutch and patent, price	$20 a 25 a 35 00
CULTIVATORS, for Corn and Tobacco,	5 a 6 50
COTTON GINS made to order, from patterns most approved by the southern planters, price $50 a 150 each.	
Corn and cob crushers, price	$65 00

75 Tons Plough and Machine Castings.

And in short every other implement appertaining to the wants of the farmer.

ROBERT SINCLAIR, Jr. & Co.
Light, near Pratt Street Whf. Baltimore.

Feb. 1, 2t.

TUITION.

Two or three vacancies in the subscribers' school may be occupied, on early application.

JUNIUS K. HORSBURGH.

Petersburg, March 1, 1837.

SPANISH JACKS.

THE subscriber has for sale, five Spanish Jacks, imported in 1836. They are all young, and certified to be *proved breeders*. They are of good size, being from 52 to 55 inches high, stout built and healthy—colors, white and grey.

The exportation from Spain of Jacks of this breed and quality, is, by law, prohibited: but the near approach to Malaga of the army under Gen. Gomez, last fall, caused the shipment of these animals, among other valuable property, from that port. Considering these circumstances, it is improbable that another opportunity will occur of procuring *such* Jacks. These will be sold at from $1000 to $1500 each, *if applied for immediately*: but if not sold soon, they will be placed at service for the season at hand.

Also. a young Jack, bred in this country from first rate stock, grey, two years old, and of good promise. Price $500.

Also, several fine **JENNETS,** some of them in foal to a MALTESE JACK, 14 hands high.

ALSO, A VERY FINE IMPORTED

SHORT HORN DURHAM BULL,

Purchased at Col. Powell's sale last November. He is about 18 months old, nearly all red, and has a perfect pedigree. Price, $300. Apply to

I. I. HITCHCOCK, Agricultural Agent,
No. 5, South Fifth street, Philadelphia.

March 1.—1t

LANDRETH'S

GARDEN SEEDS,

Waranted Fresh and Genuine.

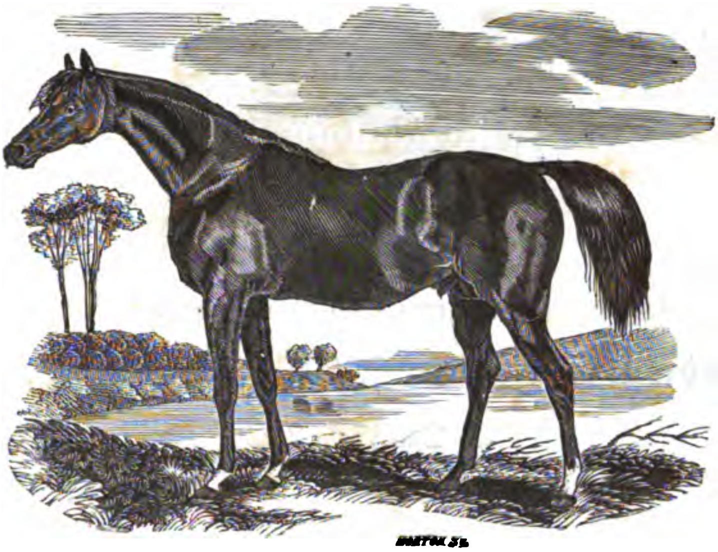
FOR SALE BY CAMPBELL AND RUFFIN.

ASPARAGUS.
BEET—
  Long blood red,
  Early turnip.
BEANS—
  Long pod,
  Six weeks,
  Early speckled valentine
  Brown do do
BROCOLI.
CABBAGE—
  Early York,
  Large drumhead,
  Green curled Savoy,
  Red Dutch.
CARROT—
  Long orange,
  Early horn.
CAULIFLOWER—
  Early.
CELERY—
  White solid,
  Red do.
CUCUMBER—
  Long prickly,
  Early frame.
ENDIVE.
LEEK.
LETTUCE—
  Early Silesia,
  Large curled India,
  Early curled,
  Green Cos,
  White Cos.
MELON—
  Nutmeg,
  Citron.
ONION—
  Silver skin,
  Wethersfield red,
  Stratsburg.
PARSLEY.
PARSNIP.
PEAS—
  Landreth's extra early,
  Early frame,
  Early Charlton,
  Dwarf marrowfat,
  Blue imperial.
PEPPER.
RADISH—
  Long salmon,
  Long scarlet,
  Short top,
  White turnip,
  Summer white.
SPINACH.
SQUASH—various kinds.
TOMATOES.
TURNIP.

FLOWER SEEDS of various and choice kinds.

February 26.—2t

IMPORTED HORSE



SHAKSPEARE.

THIS splendid and magnificent horse, a genuine specimen of the Newmarket race horse, will make his second season in America at my stables, one mile east of Lawrenceville, in Brunswick county, Virginia. He will serve mares at $75 the season, to be discharged by the payment of $60 within the season; and $100 insurance, payable whenever it is ascertained the mare is with foal, or transferred, with $1 cash to the groom in each case. Any gentleman putting, or assuming payment for six mares, may have them served at $50 each. Good and extensive pasturage, and black servants boarded gratis, and mares will be fed with grain at 25 cents a day. Every precaution will be taken to prevent accidents or escapes, but no responsibility for any.

Shakspeare is a tried and approved stallion in England, patronized by many eminent sportsmen, as the Duke of Grafton, Mr. Wilson and others—and his colts are running with extraordinary success. He is a large brown horse, 16 hands high, with excellent action, uncommon beauty and strength, and the best constitution and temper. In these respects he is not surpassed, and probably not equalled by any horse in the United States. He is a horse of the finest form and the very highest racing character; and was not only a first rate runner himself, but what is of far more importance, his stock is first rate in England. His colts have run against the best colts and beat them, and have been frequent winners at Newmarket. To prove the value and success of his stock, it is sufficient to state that, last year, he had more two years winners, (one of which was never beaten,) than any horse in the kingdom, except Priam and Sultan, and as many as Sultan, they having the same number. On such a horse, eulogy would be misplaced.

PEDIGREE OF SHAKSPEARE.

He was got by Smolensko, winner of the Derby; his dam Charming Molly by Rubens; Comedy by Beningbrough; Mrs. Jordan by Highflyer; Harriet by Matchem; Flora by Regulus; Bartlett's Childers; Bay Bolton, &c.

For particulars, see handbills. The weather being good, an effort will be made to show him at Nottoway, Lunenburg, and Mecklenburg Courts, in March or April.

JOHN D. KIRBY.

March 1, 1837.

JOHN POLLARD,

SADDLER, AND HARNESS MAKER,

SYCAMORE STREET, PETERSBURG, VA.

March 1, 1837.

VAN-LEW & MORTON,

SYCAMORE, FRONTING BOLLINGBROOK STREET,

IMPORTERS AND DEALERS IN

Hardware, Saddlery, Cutlery, Guns, and

PISTOLS.

March 1, 1837.

JOHN VAN-LEW,
QUIN MORTON.

ALLEN P. LEE,

Sycamore Street, Petersburg, Va.

Saddle & Harness Maker,

Manufactures and keeps on hand for sale, all articles belonging to his line of business.
March 1, 1837.

PATRICK FOLEY,

Bollingbrook Street, Petersburg, Virginia,

WHOLESALE AND RETAIL DEALER IN

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February 1, 1837.

EDMUND RUFFIN.

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EDMUND RUFFIN, *Editor and Proprietor.*

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Editor's Address— Edmund Ruffin, *Petersburg, Va.*

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EDMUND RUFFIN.

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Bank—Virginia—per share, - -	100			118	5
Farmers', - - - -	100			115	4½
Rail Road—Petersburg and Roanoke,	100	110	113		5
Portsmouth and Roanoke,	50	40		40	Unfinished
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Greensville & Roanoke, (both new and old stock.)	100	108½	109½	109	do.
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Petersburg Cotton Manufactory, - -	100	130		125	10
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TO CORRESPONDENTS AND READERS.

The following communications are on hand. "*On the causes of the decline and depression of agriculture in Virginia, No. II.*"—"*On the expense of tobacco culture, compared with that of wheat and corn*"—"*On hog raising*"—"*On the suitableness of warm climates for wine making*"—"*A few desultory thoughts, &c.*"—"*On the use of rakes instead of hoes, for weeding corn, &c.*"—"*On the mania for emigration*"—"*On counting the cost of new improvements, or operations, applied especially to settling plantations in the south-west*"—"*Items of husbandry*"—"*Mode of raising water-melons and cantaloupes.*"

☞To admit some pieces which would lose much interest, and perhaps effect, if delayed in the next number, it has been necessary to give to this, 8 pages more than the usual size. The next, (No. 12,) will therefore be as much less than the usual quantity of 64 pages.

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Haller Nutt

THE

FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the improvement of the Practice,

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

Vol. IV. APRIL 1, 1837. No. 12.

And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." *Swift.*

PETERSBURG, VA.
PUBLISHED BY THE PROPRIETOR,
1837.

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BEET—
  Long blood red,
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BEANS—
  Long pod,
  Six weeks,
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  Brown do do
BROCOLI.
CABBAGE—
  Early York,
  Large drumhead,
  Green curled Savoy,
  Red Dutch.
CARROT—
  Long orange,
  Early horn
CAULIFLOWER—
  Early.
CELERY—
  White solid,
  Red do.
CUCUMBER—
  Long prickly,
  Early frame.
ENDIVE.
LEEK.
LETTUCE—
  Early Silesia,
  Large curled India,
  Early curled,
  Green Cos,
  White Cos.
MELON—
  Nutmeg,
  Citron.
ONION—
  Silver skin,
  Wethersfield red,
  Stratsburg.
PARSLEY.
PARSNIP.
PEAS—
  Landreth's extra early,
  Early frame,
  Early Charlton,
  Dwarf marrowfat,
  Blue imperial.
PEPPER.
RADISH—
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February 26.—2t

THE FARMERS' REGISTER.

VOL. IV. APRIL 1, 1837. No. 12.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

REPORT OF THE PROGRESS OF THE GEOLOGICAL SURVEY OF THE STATE OF VIRGINIA, FOR THE YEAR 1836.

BY WILLIAM B. ROGERS,

Professor of Natural Philosophy in the University of Virginia.

I beg leave to make the following report of the progress of the geological survey of the state, during the past year.

Proper assistants having been appointed, as provided in the law, the active investigations in the field were begun about the middle of April, and were continued without interruption until the beginning of November. During this time and nearly up to the present date, whilst not myself engaged in the task of exploration, the chemical researches connected with the survey have been steadily progressing under my immediate and constant superintendence.

In aid of the field operations, and as an important preliminary to the correct delineation of geological details upon the state map, the work of taking accurate copies of the county maps was begun early in the season, and has progressed so far as that at the present time more than fifty of these maps are ready for the uses of the survey.

In the course of the geological investigations of the season, upwards of twenty boxes of specimens were collected, illustrating the structure and economical resources of the various districts visited, and furnishing materials for analytical examination.

In the prosecution of the work, each of the following regions was more or less the theatre of research.

1st. The peninsula of the Potomac and Rappahannock rivers.

2d. The counties bordering on the Rappahannock to the south.

3d. The bituminous coal fields of Henrico, Goochland, Chesterfield and Powhatan counties.

4th. A portion of what is called the "gold region" in the counties of Fauquier, Spottsylvania, Culpeper, Louisa, Orange, Goochland, Fluvanna and Buckingham.

5th. A transverse belt of country extending westward from the neighborhood of Fredericksburg, to the vicinity of Moorfield, in Hardy county.

6th. The northern counties of the valley, from the Potomac, to the neighborhood of Luray and Newmarket, together with a portion of the adjacent mountain district to the west.

7th. The counties of Washington, Wythe, Smyth, Montgomery and Grayson, in the southwest.

In most of the districts above enumerated, the investigations were conducted in the manner of a reconnoissance, with the view of establishing a basis for future specific and accurate research, and it is important to bear in mind, that from the diversified features of our geology, and the almost total absence of any knowledge of it from previous investigation, such preliminary surveys in each district become indispensable to the successful and rapid prosecution of the minute inquiries which are to constitute the chief value of the survey. But while for the most part, the operations of the past year were of the general character here described, in some districts the observations were carried into minute detail, and in all of them a great number of facts were gathered, calculated to illustrate their geological structure, and the nature and extent of their mineral resources.

But as the exhibition of details at present, would obviously be incompatible with the design of "the annual reports upon the progress of the survey" contemplated in the law—they will be reserved for incorporation in the final report—in the meanwhile, having the benefit of a revision, with the additional lights acquired in the prosecution of the work.

In the first of the regions above indicated, the observations were very numerous and minute. Nearly all the important exposures, illustrating the geology and mineral resources of the peninsula, were carefully examined; the strata observed in each, being noted, and specimens retained for illustration and chemical research. The boundaries of the two divisions of the tertiary, the eocene and meiocene, were determined with all needful accuracy upon the Potomac and Rappahannock, and were approximately settled as to intermediate points.

The disposition and nature of the beds composing the meiocene in this portion of the state, were found to be comformable with those of the peninsula of the James and York rivers, chiefly referred to in the report of the reconnoissance published last year. Here, as well as in that region, the *bluish marls* were found low down in the series of meiocene strata, and a thin band of ferruginous rock or clay was generally observed to be interposed between them and the diluvial sand and gravel. Indeed, so uniform is the position of this layer, in relation to the marl, that *its discovery at any point would furnish grounds for the strong, if not confident anticipation of finding marl beneath.*

A large proportion of the marl beds of the Neck, containing carbonate of lime in sufficient quantity to prove available in agriculture, are of the description which has just been noticed; at the same time strata in which the shells are mingled with sand and clay of various shades of yellow and brown, are not unfrequent. A fragmentary rock, consisting of broken shells cemented by carbonate of lime, sometimes partially crystallized, and white pulverulent or chalky marls are also found.

Of these the most abundant, or *blue marl*, though often presenting the appearance of great richness from the number of perfect shells which it contains, has been found to be less charged with carbonate of lime, than some of the other varieties.

The mean of upwards of fifty specimens of this description which have been analyzed in the course of the season, is 36 per cent. of carbonate of lime; and in few instances did the result rise as high as 40 per cent., while the light colored rocky and chalky marl yielded a proportion more than twice as great.

In general, the upper beds of the meiocene in this district, were found to be destitute of fossils, though full of their casts and impressions. These strata consisting for the most part of light colored sandy clays, frequently of great depth, are distinguished by a sulphureous smell, and often by an acid and styptic flavor. They rarely contain an appreciable amount of carbonate of lime, but are impregnated with sulphate of lime (gypsum.) together with sulphate of iron, (copperas,) sulphate of alumina, sulphur and sometimes even a sensible amount of sulphate of magnesia (Epsom salts.) The acidity of these clays is often sufficient to make a pungent impression on the tongue, and their sulphur is distinctly recognized by the characteristic odor exhaled, especially when they are heated. In many localities, as in the Rappahannock cliffs in Richmond county, the gypsum occurs in crystals of sufficient magnitude to be separated by the fingers, and sometimes in the attractive form of transparent *selenite;* but its more usual condition, is that of delicate silken crystals distributed through the mass, and visible only upon close and attentive inspection.

Numerous specimens, taken from strata of this kind in various parts of the Neck, presented a great similarity of composition, though not without much variation in the proportion of the gypsum and other ingredients which they contained, and like results were obtained from the analysis of the overlying and once fossiliferous beds in other places, where the meiocene marl occurs. The cause of the extensive destruction of shelly matter once imbedded in these clays, was clearly traced to the *sulphuric acid,* originating in the decomposition of sulphuret of iron, which permeating the beds of marl, converted the carbonate into sulphate of lime. This being in part retained, formed the crystals of gypsum now discovered in these strata—at the same time, that by the decomposition of the sulphuret, the sulphate of iron and other ingredients above noticed were brought to light; and the overlying layer of ferruginous rock, or clay, most probably owes its origin to the same source.

The presence of gypsum in these beds suggests the interesting inquiry as to how far they may become available in the agriculture of this and other regions, similarly situated. Upon this point, I shall embrace the present opportunity for a few brief remarks. Where they contain a considerable amount of this ingredient, say 10 per cent., and are impregnated with no injurious or counteracting agent, no doubt can exist as to their beneficial influence upon the soil; and in such cases, besides the peculiar ameliorating effect of the gypsum, they would impart the further advantage of an improvement in the texture of the land. But as in most instances, the proportion of gypsum does not exceed two per cent., and as it is blended with the other sulphates, as well as free sulphuric acid and sulphur, ingredients which in considerable quantity are known to be destructive to vegetation, it would naturally be inferred, that such materials, if not inert, must be actively injurious in their effects upon the soil. Experience too, has seemed to give authority to this opinion, since when applied to the land, as in some cases these materials have been, in considerable quantities, a diminution, or even temporary loss of productiveness has ensued. Still, however, it should be remarked, that experiments thus roughly made, by no means justify any confident conclusion on the subject. The effect of such substances on vegetation must greatly depend on the *quantity* in which they are applied. When prodigally spread over the land, there can be no doubt that they inflict serious, though by no means irreparable injury. Such also is known to be the consequence of a redundant application of the ordinary calcareous manures. But observation would seem to prove that, when *sparingly employed,* the materials referred to, are productive of a very decided improvement. In many parts of lower Virginia, these gypseous and acidulated clays applied under the impression that they contained a useful proportion of green sand, have been found to impart new and surprising energy to the soil.

Without entering upon the obscure question of the *modus operandi* of mineral substances, including calcareous manures, upon plants, we cannot doubt, that in part, at least, their influence is that of directly stimulating the vital organs concerned in vegetable growth—nor can we avoid believing, that with plants, as with animals, the number of substances adapted to produce this effect is far from being restricted to the few materials most commonly in use. We have the positive testimony of numerous experiments to prove that many substances of high chemical energy are capable in small quantities of favoring the growth of plants.

Without, therefore, advancing any hypothesis as to the peculiar agency of the sulphates and other matters contained in these gypseous clays, or attempting, *a priori,* to pronounce upon their effects either as salutary or injurious, I feel sufficiently sustained by observation in expressing it as my opinion, that they will one day be made available in the agriculture of this region—and I would urgently suggest the importance of making careful experiments to determine the quantity in which they may be safely and advantageously applied. But in all such trials, let it be borne in mind, that only *small quantities* of such of these materials as are strongly styptic and sulphureous should be employed.

The eocene strata of the peninsula are comprised in the district lying between a line connecting Mathias's point on the Potomac, with the mouth of Chingoteague creek on the Rappahannock, and another and crooked line nearly coinciding with the eastern boundary of the sandstone formation in Stafford county. These beds were found to exhibit less uniformity of arrangement than those on the Pamunkey and James rivers, formerly described. In general, the lowest stratum is of a dark greenish blue color, and those which lie above it, have various shades of yellow, greenish grey, and brown. In many instances, the upper strata are devoid of shells, but replete with their casts and impressions, and with the exception of generally containing a notable amount of green sand, are strikingly analogous in composition to the gypseous and sulphureous strata of the meiocene. To make the resemblance still more complete, a thin layer of ferruginous gravel or rock frequently overlies these beds, and forms the boundary between them and the meiocene.

This remarkable resemblance in the situation and character of the two, while it leads us to infer the action of like chemical agencies upon both, assures us of a similarity in their agricultural effects.

The eocene marls of the peninsula, present much diversity of composition. Whilst in some localities, the shelly matter forms a very considerable part of the mass, in others, little or none of it occurs. The green sand often forms a prominent ingredient, and is in no case absent, though frequently the amount of it is very inconsiderable. Gypsum is also occasionally to be met with; and this, as well as the other sulphates, is not excluded from the beds containing shells. A minute analysis of some of the more important of these marls is now in progress, but the research is one requiring much time for its completion.

It may be useful to state, that in general, the shelly strata of the eocene, in this district, do not contain more than from ten to fifteen per cent. of carbonate of lime, and that in many instances, where the shells are quite conspicuous, the proportion is less than one half of this. In the shell rock, such as occurs in several places on the Potomac, as much as eighty-two per cent. has been found.

It would therefore appear, that while in some instances, there is a sufficient amount of carbonate of lime in the mass to give it the character of a rather poor calcareous marl, the proportion of this ingredient in general is too inconsiderable to impart any high degree of agricultural value. For much of the benefit derived from the application of these substances to the soil, we must look to the green sand, gypsum, and perhaps other ingredients which they contain. Experiments now in progress with some of the varieties containing little or no shelly matter, indicate decidedly beneficial results; and there is but little reason to doubt that more extensive trials of these materials, conducted with judgment and caution, will confirm the views at present entertained of their capacity of being highly useful in agriculture.

From the absence of shelly matter in the strata of Meiocene and Eocene above referred to, they have hitherto been considered as entirely destitute of value. The fact now made known of their containing, nearly in every case, a notable amount of gypsum, must therefore be looked upon as an interesting discovery, and should the observations already made upon the fertilizing effects of the material of these beds, be sustained by a wider and more varied experience, our views of the agricultural resources of the eastern portion of our state will be greatly and cheeringly enlarged. Believing that such is to be the result of further experiments on the subject, I look with pleasing anticipation to the time when the invaluable shell marl of the country, will not be without a substitute in those districts to which it has been denied, and *when almost every ravine in eastern Virginia will be resorted to for materials to improve the productiveness of the soil.*

The researches in the counties bordering on the Rappahannock to the south, were chiefly confined to an inspection of localities of marl, and the examination of the strata associated with it, in several of the more important points. The numerous specimens of the Meiocene marl which were collected in the reconnoissance, have been submitted to analysis, and with the same general results as have been stated in regard to the marls of the Neck; the pulverulent and light-colored varieties always yielding a much larger per centage of carbonate of lime than the blue marl, and sometimes, as in the case of specimens from Mr. Oaks's, and other places in Middlesex, amounting to about 80 per cent. Gypseous and sulphuretted clays were found here as in the Neck; and at some points immediately on the river, the *selenite* was discovered in conspicuous crystals. An analysis of some of these gypseous clays, gave from 8 to 10 per cent. of this ingredient.

Before concluding this sketch of the investigations in the tertiary region during the past year, it may be well to remark, that in the event of an ampler organization of the means of exploration, urgently demanded by the survey, the revision of the ground already traversed will be aided by the employment of a boat built and equipped for the service. With such facilities, the exploration, in districts hitherto unexamined, will be carried on with increased accuracy and speed.

The researches which were made in *the bituminous coal fields of Henrico, Goochland, &c.* were in the first place directed to the determination of the boundaries of the region in which the coal measures occur. With this view, it was explored by transverse lines, and throughout its entire circuit; but further examinations are required to ascertain its extent and structure, with the degree of accuracy necessary to represent it on the map. And before this delineation can be usefully made, the important errors in this portion of the map will require to be corrected.

All the important workings for coal, together with a large number of shafts or diggings of minor interest, were examined; but additional investigations are required to secure that exact knowledge of the complicated structure of these coal fields, which may serve, hereafter, as a guide to enterprises in this region. I feel safe, however, in remarking that the observations thus far made, whilst they indicate that the region containing coal is more extensive than I had supposed—are calculated to strengthen the opinion, that in no part of the basin is the depth of the coal so great as from a view of the directions of its out-crop would be supposed—and if, as is probably the case, the floor upon which it rests is of so undulating a figure, as in some measure to divide the region into several basins—there is a reasonable hope of reaching this mineral at comparatively moderate depths, even in the centre of the field.

Although these coals have long been extensively in use for domestic and manufacturing purposes, no systematic investigation of their *chemical composition* has hitherto been attempted, nor have any just data been furnished for comparing them with the coals of other regions, either in this country or abroad. The minute investigations on this subject, in which I am now engaged, have already made me accurately acquainted with the composition and heating powers of upwards of twenty of these coals, and I feel no hesitation in saying, in view of these results, that I am prepared to vindicate their claim to a very high rank in comparison with the coals of most other parts of the world. Without entering into details, it may be useful to state, that in the specimens hitherto examined, the amount of bituminous matter, varied from 27 to 38 per cent. of the whole, the ash in general from 2 to 5, and that the combustible value or heating power of the several specimens, as determined by a very perfect process, is represented by an amount of pure charcoal from 75 to 89 hundredths of the whole weight of the coal.

Whilst referring to the valuable character of these rich deposites of bituminous coal, I am anxious again to call attention to the *iron ores* which accompany them in several places. Since the former report, in which allusion was made to the probable importance of these ores to the manufacturing industry of eastern Virginia, several specimens have been submitted to chemical analysis, and from the results obtained, the really valuable character of the ore may be considered as satisfactorily established.

A specimen of hematitic ore from the neighbourhood of Trabue's pits in Chesterfield, gave in the 100 grains the following ingredients:

Per oxide of iron,	85.15
Silica,	4.20
Alumina,	4.00
Water,	6.50

The existence of this mineral in immediate contiguity with the coal, is a fact of such obvious importance, that no commentary is needed to make it deeply interesting to persons of capital and enterprise, who may be concerned in developing the resources of this portion of the state.

In that portion of what is called the gold region of the state in which research was prosecuted, all the important openings were visited in which the precious metal is, or has been obtained. Many circumstances of practical and scientific interest connected with each of them were noted, and suites of illustrative specimens procured. But much additional observation is required, before it will be safe to speak confidently of the geology of these veins, or to pronounce upon the extent to which they are likely to contribute to the resources of the state.

I would not have it inferred from these remarks, that any unfavorable impression, as to the ultimate value of our gold mines, has grown out of the various facts relating to them, which have been thus far collected. On the contrary, I am more strongly than ever of the opinion, that the working of the innumerable auriferous veins of this wide region is destined to become an important branch of the systematic industry of the state. And whilst I would deprecate those overwrought anticipations of their productiveness which the brilliant developments occasionally made are calculated to inspire, I would give a sober encouragement to the enterprise and capital which they are rapidly attracting, believing that in the majority of instances, these veins have that wholesome degree of fertility which is capable of giving to industry a steady incentive, and a reasonable reward.

In exploring the *belt of country referred to under the 5th head*, an approximate profile was constructed, extending from Fredericksburg to Moorfield, exhibiting many of the important features in the structure of the intervening region. The country on both sides of this line was examined rapidly, though with considerable minuteness, excursions for specific objects being made as far as the Potomac on the one hand, and to the remote parts of Culpeper, Rappahannock and Orange counties on the other.

The valuable strata of freestone, which overlie the primary rocks near the lower end of this line were inspected at various localities, near Fredericksburg, below this city on the river, and at several points in Stafford county, and it is believed that some useful views were attained with regard to the geological character of these beds, as well as the circumstances under which they furnish the most durable material for building.

Beyond this to the west, the primary rocks, the slates of the gold region, together with the iron ores occurring in them, and the narrow belt of talcose limestone which shows itself on the Rapidan, at Mountain run and other localities, were successively observed. The limestone here referred to, is a continuation of the narrow belt which appears between Lynchburg and Scottsville on the James River, and is laid bare at various points in Albemarle and Orange. A fragment from the cliff at Mitchell's ford on the Rapidan, yielded in the 100 grains 81.81 grains of carbonate of lime, thus vieing in purity with the limestones of the Valley—and indicating the advantages which might be conferred upon the soil of the neighboring country by the use of such lime as it would furnish. The iron ore from the site of the old works at Chancellor's, was examined and found to be of good quality.

At a short distance to the west of Germanna ford, commences the region of calcareous shales and sandstones. This, though of considerable breadth, and extending from the Potomac southward through Orange county, and probably, with some interruptions, far into North Carolina, constitutes an important feature in our geology, to which little or no attention has hitherto been given. These shales and sandstones were traced in Fauquier, Culpeper, Rappahannock, Orange, Prince William and Loudoun counties, and the interesting fact determined that the *Potomac marble* constitutes one of the beds of this series of sedimentary rocks. A calcareous and very mixed conglomerate, similar to that of the Potomac, was found near the eastern flank of the Bull run mountain, continuous with the quarries upon that river. In topographical features and character of soil, as well as in geological structure, this region bears a striking resemblance to what are called the red shell lands of Pennsylvania and New Jersey. In no district of the state, is the connection between the nature of the prevailing rocks and the qualities of the soil, more strongly marked than here. The red slaty sandstone, containing a considerable amount of carbonate of lime, imparts productiveness to the adjacent red soil, while the more siliceous rocks are marked by the steril character of the fields, where they are exposed. In some of the grey micaceous sandstones of a coarse texture, such for example as are seen in the neighborhood of Cloverland, near the base of the Bull run mountain, I discovered visible crystals of carbonate of lime, and found the rock in general to be quite calcareous. Hence the rich growth of clover which adorns the fields, and the luxuriant vegetation which spring up among the debris of the quarries.

A curious feature in the composition of some of these rocks, is the presence of the green carbonate and the sulphuret of copper. This fact, which appears to have been observed at a very early period after the settlement of the country, has unhappily kept alive the hope of discovering, in these shales, veins of a workable copper ore, and has led to repeated enterprises in mining, from which no really profitable result appears ever to have been derived. Most of the openings, either ancient or modern, have disclosed nothing more than a calcareous shale, slightly *filmed* with the green carbonate, and making, in some cases, a superficial show of richness, where analysis discovers only an insignificant amount of the enticing mineral.

The specimens of the *sulphuret of copper* found in several places are frequently of a very favorable character, but no indications can be discovered of its being present in sufficient quantity, to justify the erection of works for smelting.

In this series of rocks, there occurs a blackish slate, marked with the impressions of fossil vegetables, and containing much bituminous matter and thin seams, or rather films, of coal. Similar impressions are abundant also in some of the other associated beds. Indeed, the general aspect of the rocks of this district is, at first view, not unfavorable to the idea that it embodies valuable fields of coal. But while I would by no means assert that seams of this mineral, of one or two inches in thickness, may not occasionally be found, *I cannot think it probable that any vein of workable extent will ever be discovered among these shales.*

Besides the belt of limestone already referred to as seen on the Rapidan in the line of our section, another narrow ledge is found in Fauquier and Loudoun counties, to the west of the Kettoctan and Bull run mountain, and widening as it approaches the Potomac. This rock, which is well adapted to the making of lime, is in some places burnt for that purpose, but it is painful to remark here, as in other places similarly fortunate in position, how little benefit is reaped from the possession of a resource of such high agricultural utility.

In many parts of the Blue Ridge, in the neighborhood of the transverse belt whose general characters I am describing, virgin copper and the green carbonate, have been discovered in thin veins and small masses in the body of quartzose and epidotic rock. In the neighborhood of Stoney Man, one of the loftiest and wildest of the peaks of this range, near Swift run gap, and at several other points, small specimens have been picked up, and their richness both in the metal and its carbonate, have inspired the sanguine with a confident belief of the existence in the bosom of the mountain of treasures of this nature, of exhaustless extent. But in regard to all such anticipations, it should be borne in mind, that the *quantity* is not less important than the *quality* of the ore, to stamp it with real value, and that until far more minute and extensive researches in regard to these ores have been made in the localities where they are found, than have ever hitherto been attempted, it will be impossible to have any grounds for judging of their extent, and it will be as unwise as hazardous to engage in expensive schemes of mining on their account. Yet I would not have it understood, that such researches are to be considered as hopeless or inexpedient. I would rather rejoice to see investigation active, at the same time that, in duty to the public interest, I would caution against that precipitate and over sanguine spirit which will not wait for deliberate research—a spirit which, in no instance, is more likely to terminate in loss and disappointment, than when excited by objects of this nature, involved as they must be, even to the diligent scientific explorer, in unavoidable obscurity and doubt.

In the counties of the Valley and in the neighboring mountains, the researches were of a character deeply interesting to the progress of the survey. After much toil and perplexity, occasioned by the rugged features and complicated structure of the mountainous districts which were examined, the true relations of the rocks and minerals of this portion of the state were satisfactorily determined. The discovery of a key to the intricate geology of the region west of the valley, as connected with that of the valley itself, must be regarded as a result of the highest practical, as well as scientific interest. Such a guide having been obtained, the researches in this most difficult field of investigation may be expected to progress with certainty, accuracy and expedition. For this important general result, I am largely indebted to the services of my chief assistant, Professor H. D. Rogers, who connecting the survey of Pennsylvania, of which he has the chief direction, with that of the contiguous portions of our state, has been enabled to throw new and valuable lights upon this and other difficult points in our geology, until now entirely misunderstood.

In connexion with these general investigations, which were indispensable as preliminaries to the minute research essential to the production of a geological map of the Appalachian region, various important observations were made in regard to the limestones, iron ores and coals, of the valley and mountains to the west. Numerous specimens of each of these materials have been subjected to chemical examination, and from the mass of results thus obtained, valuable light has been shed upon their nature, and useful applications in all the varieties of form and composition in which they occur.

A brief statement of some of the geological and chemical results thus far obtained, will serve to illustrate the momentous practical bearings of the investigation in progress in this region, and to display, in a new and gratifying point of view, the vast extent and value of its mineral treasures.

Of the twelve rocks, each marked by certain distinctive characters, composing the mountains and valleys of this region, it has been determined, that at least eight are accompanied by beds of iron ore. Each ore has distinctive marks by which it may be recognized, and peculiarities of composition fitting it for certain uses to which others would be less happily adapted. Thus, in the quantity and variety of this material in all its valuable forms, our state is now proved to have no rival, unless, perhaps, Pennsylvania may be such. Looking to the immense extent of the region over which these rocks are spread, and to the structure of its mountains and valleys—bringing to light at various points, each of the twelve principal strata which it comprises—freighted, in great part, with the most inestimable of metallic products, it becomes evident at once, that the topography of the rocks and mineral resources of this region, as it will be exhibited in the general geological map, is destined to bestow upon it a new and almost unhoped for interest. With such incentives, and with such a guide, enterprise directed to this portion of state can neither falter or be disappointed. Anticipation confiding in the certain deductions of cautious scientific research, already begins to sketch the gladdening picture of successful industry, crowd-ing population and wide spreading improvement, which, at no remote day, it will be its happy lot to realize.

The *coals* of this region were examined at numerous points from the Potomac to the neighborhood of the Tennessee line, and although much additional investigation is required to ascertain the number and extent of the workable seams of this mineral, enough has already been done to satisfy me, that they will, ere long, be regarded as one of the most valuable resources of this part of the state. On a former occasion, I adverted to the peculiar adaptation of some of these coals, in the raw state, to the *manufacture of iron*. The analysis of specimens from several localities, not visited before this season, indicates a composition admirably suited to this use. As examples of coals of this description, I will refer to the three following:

1st. The semi-bituminous coal, from Thom's creek and Strouble's run, in Montgomery county. This consists of

Carbon,	80.20
Bitumen, &c.	13.60
Ash,	6.20

The combustible value or calorific power of 100 parts of this coal, is equivalent to that of 92.5 parts of carbon.

2nd. Semi-bituminous coal from near Lewisburg. This consists of

Carbon,	78.84
Bitumen, &c.	14.16
Ash,	7.00

The calorific power of 100 parts of this coal, is equivalent to 87 parts of carbon.

3d. Catawba semi-bituminous coal—Botetourt county. This consists of

Carbon,	78.50
Bitumen,	16.50
Ash,	5.00

The calorific power of one hundred parts of this coal, is equivalent to that of 89.4 parts of carbon.

These and similar results obtained, with regard to specimens from other localities in the Appalachian region, illustrate the fitness of these coals for the manufacture of iron, a quality which must be looked upon as giving them incalculable value, when their immediate vicinity to inexhaustible supplies of the ore is taken into the account.

The vast advantages in point of economy resulting from the employment of the *raw coals* of Wales, Scotland and France, in the *smelting of iron ores*, though not unknown in this country, appear as yet to be but imperfectly appreciated. It may, therefore, be proper to remark, that wherever, in Europe, coals of the proper character can be obtained, they are preferred to every other material used for this purpose. It is surely greatly to be desired, that a trial were made of our semi-bituminous coals in the smelting furnaces, since by the result of a successful experiment of this kind, if carefully performed, a new impetus would be given to the manufacture of iron in Virginia. At the same time, the importance of applying the hot air blast, especially in connexion with the use of these raw coals, cannot be too urgently insisted upon. The large mass of experience collected of late years in Great Britain, as well as on the continent, conclusively demonstrating the great economy of this process, and the very general disposition in Europe, to adopt it wherever practicable, ought to furnish a sufficient inducement for its introduction here; and since, as Berthier has shewn, its advantages are augmented by connecting it with the use of raw coals, an especial motive is presented for its adoption in the furnaces of the region of which I am at present treating. Should these improvements be brought into extensive operation, as in process of time they most assuredly will, the prosperity of this vast and almost forgotten portion of the state, will outstrip any thing that the imagination of its present inhabitants can conceive. What surer foundation for the permanent wealth and power of a community can be found, than the stores of coal and iron embosomed in the rocky strata of its hills and valleys, and what more efficacious stimulus to the mechanic arts, to industry in general, and to the advancement of all practical and profitable knowledge, than the multifarious pursuits linked with the *manufacture of iron?*

Of the limestones of the valley, numerous specimens have been analyzed, with the view of determining the peculiar composition of each variety—a point of much importance in applying them to agricultural or other uses. A sketch of some of the results of this investigation, which is still in progress, may here be fitly introduced. I find that the *carbonate of magnesia*, is a much more abundant and common ingredient in these limestones, than has hitherto been suspected. All the rocks already tested as hydraulic cements, contain a large proportion of this substance. I have become convinced that a great number of the magnesian limestones of the valley, possess the property of hardening under water, and I am at present engaged in extensive experiments upon their qualities in this respect.

The deep blue, almost black limestone of a fine grain, and rather smooth fracture, which is commonly burnt for lime, *contains only a slight trace of carbonate of magnesia.*

Its constituents are carbonate of lime, silica, alumina, protoxide of iron, and a trace of carbonate of magnesia, with a little organic matter.

The amount of carbonate of lime usually present in this valuable rock, may be seen from the following table of the quantity contained in seven specimens of this description, procured in different parts of the valley. A great number of similar results might be added to the table from my minutes, which include the composition of more than thirty specimens, but the seven here given will suffice.

1.	2.	3.	4.	5.	6.	7.
86.3	83.4	85.2	87.5	82.9	83.6	82.8

It appears from this, that no great diversity exists in the quality of this rock in different localities. Taking 84 per cent. as the average quantity of carbonate of lime present in this variety, it is easily inferred from the composition of the carbonate, *that each* 100 *lbs. of the rock, ought to yield* 47 *lbs. of lime.*

The *dark dun colored limestone* of very close grain and semi-conchoidal fracture, is even more exempt than the preceding from carbonate of magnesia, and is richer in carbonate of lime. The specimens examined, gave an average of 88 per cent. Accordingly, where it has been burnt, this rock has yielded lime of great purity.

The *limestone of a dull greyish blue* color and of coarse texture, contains a notable portion of *silica* *and carbonate of magnesia*, and has often the properties of a *hydraulic cement*. The following is the composition of one of several specimens of this variety which were analyzed. It was obtained from a hill, one mile north of Staunton. One hundred grains contain

Carbonate of lime,	49.50
Carbonate of magnesia,	33.87
Silica,	7.50
Oxide of iron and alumina,	2.83

The rock of a light greyish blue color, and of very compact texture, almost always contains a large proportion of silica, as well as carbonate of magnesia. The hydraulic lime made at Shepherdstown, is generally procured from this rock. The following is the composition of a specimen of this kind, from Reynolds' quarry. But it is to be observed, that even from this neighborhood, the cement rocks exhibit a great diversity in the proportion of their constituents. One hundred grains contain

Carbonate of lime,	32.17
Carbonate of magnesia,	18.36
Silica,	38.93
Ox. iron and alumina,	4.17

The rock to be used in preparing cement for the locks of the James river canal, is of this kind. It is obtained in Rockbridge county, and contains

Carbonate of lime,	38.33
Carbonate of magnesia,	16.30
Silica,	36.60
Ox. iron and alumina,	6.33

It will appear, from what has been stated, in regard to the aspect of the several varieties of limestone above described, that any careful observer may in general distinguish between those rocks which are magnesian and those which are not. This is a matter of no small importance, especially in the agricultural employment of the lime, since, if not actually injurious, as was once supposed, the magnesia is at best an efficient substitute for lime. Moreover, the rocks containing it are more difficult to burn than the others, and unless when hydraulic, the lime they yield is not so well adapted for mortar.

The great abundance of the dark blue limestone, so admirably suited to the uses of the farmer, holds out a strong inducement to the employment of lime upon the soil. In my former report, I attempted to move the mistaken impression, that the land of limestone regions is already sufficiently imbued with calcareous matter, by appealing to the results of analysis; and I would now repeat the observations then made, as having been confirmed by further examination.

There cannot be any fact in practical agriculture more clearly proved, than the beneficial action of lime upon the soil of limestone regions, such as our valley. Why then is it not extensively used by the farmers in that portion of the state? With so sure and inexhaustible a means of improvement, (every where around them,) every hill and valley might be made productive. This is one day to be the result of the systematic and general use of lime, aided by an improved scheme of agriculture. But I would gladly speed the progress of amelioration, by pointing to the invaluable resource which nature has provided for the improvement of this country, and by expostulating earnestly, on grounds of science and experience, with those who are disposed to neglect the boon.

The reconnoissance of the *south-western counties*, embraced a rapid examination of parts of Grayson, Wythe, Montgomery, Smyth and Russell, and included a more detailed investigation of the lead, plaster and salt of this region.

The *lead mines* are situated near Cripple creek, about four miles from Poplar Camp furnace, in a direction a little south of west. They are within half a mile of the south bank of New river, and about one and a half from the base of the Poplar Camp or Iron mountain. The ore occurs in a siliceous limestone generally of a white or grey color, though sometimes blue. The veins are irregular in dip and direction, frequently turning very abruptly, and sending off leads or branches. On either side of the ore, the enclosing material continues of a soft texture, as far as the walls of limestone enclosing the whole, which vary in their distance from each other. On the upper side of the vein, is generally found a reddish clay. On the lower side, is a firmer material, containing crystals of phosphate of lead and other matters. This, the workmen here, as in Europe, call clinker, and they reject it as of no value.

The vein proper, is in general twelve inches thick, and contains the following ores of lead:

1. Compact sulphuret or blue ore.
2. Compact carbonate or grey ore.
3. Crystallized carbonate—or Cat's tooth.
4. Mixture of carbonate and oxide—brown and red ore.
5. Finely divided sulphuret—black ore.

The sulphuret, or blue ore, occurs only in some parts of the vein in irregular masses or cups as they are called, and does not occupy one half of the productive portion of the vein. The other ores occur along side of it, and are mingled with it. The adjacent limestone is sometimes in a soft and crumbly condition, and curiously spotted—sometimes in the form of a beautiful white spar containing crystals of cubical galena.

There are six openings at present wrought, each having drifts below the surface at various depths, from 30 to 120 feet. These are all comprised within a space of less than 150 yards square. To the S. W. are numerous pits, from which ore was extracted in former years. The entire distance through which the lead has been traced and wrought in this vicinity, is about half a mile. The general direction of the veins, is nearly N. E. and S. W. One of the same description has been found at several points to the N. E., and among others at Mr. Sawyers', on Reed creek, about seven miles from the mines. Blue ore has also been found in small quantity on Mr. Graham's land, at an equal distance, in a due north direction. Whether a valuable amount of the ore exists at either of these places, or in any of the numerous localities in other and distant parts of the valley in which specimens have been discovered, it is impossible to say, without much further investigation.

The extent of the workable ore, at the mines just described, appears from the indications observed, to be very considerable, and it were greatly to be desired, that a systematic mining of these veins were undertaken upon a scale commensurate with their value. At present, a wasteful method of excavation is threatening serious injury to the interests of future mining operations in this region, and, if persevered in, will destroy the usefulness of many portions of the veins now worked, by rendering them almost inaccessible, or incapable of being farther wrought.

In the operation of washing at what are called the "buddles," though conducted more judiciously than the mining—there is evidently a larger proportion of useful material carried off, than ought to be allowed to escape. This fact I ascertained by an examination of the ochreous earth deposited by the stream at some distance below the buddles.

The position of the veins in a hill near the south bank of the New river, makes it obvious that a tunnel driven through the base of the hill into the veins, would afford great facility to the operations under ground, whilst it would open up a great extent of the ore, and would dispense with the expensive and inefficient process of raising the ore in buckets. By locating the buddles and the furnaces at the mouth of such an adit, a combination of advantages would be secured. It is estimated, that 25 per cent. of the material, as it is procured in the crude state from the mines, is removed by washing at the buddles, and that 100 lbs. of the rough, or 75 of the washed ore, will yield 50 lbs. of metal. A result so very high ought to invite attention to this interesting region, especially when it is considered that this is the only available body of lead ore, in any of the Atlantic states.

The fact, that by far the larger portion of the lead, which these mines furnish, is carried in wagons to Baltimore, is a striking proof of the lucrative nature of the manufacture, and strongly indicates the benefit which, in reference to this product, the public may be expected to reap from the extensive works of improvement which have been so wisely projected, in this portion of the state.

The *plaster banks*, in the North Holston and Walker's creek valleys, are another of the gifts which liberal Nature has bestowed upon this favored region. The geological structure of the valley of the Holston, is fraught with peculiar interest. After descending the northern slope of Walker's mountain, we come in view of the lofty limestone hills, forming the southern boundary of the valley, and taking our station upon some elevated knoll, we see spread out before us a scene of singular variety and beauty. Hills of limestone, apparently arranged in rows, presenting conical and rounded outlines of surprising symmetry and elegance, are stationed along the valley at nearly equal intervals. The rich verdure that spreads to their very summits, darkened by the thick foliage of the sugar trees growing on their steep sides, softens the picturesque wildness of the landscape, and conveys the idea of a soil of exuberant fertility. In the three first ranges of these hills, the southern dip of the rocks in Walker's mountain and the intervening country is preserved, but nearer to the river the limestones are seen dipping in the opposite direction. The anticlinal axis marked, as occuring in a black slate, is in the immediate vicinity of the plaster banks and the wells from which the brine is obtained. This axis extends far to the east and west, and constitutes an important feature in the geology of this region. The plaster has been found along this valley, and in that of Walker's creek, which joins it to the east, for a distance of about forty miles. Whether it extends in the latter direction, beyond the termination of this line, cannot as yet be known—but even should it not surpass this limit, the value of the deposite would baffle calculation. It does not occur as is sometimes supposed, like the other rocks of the country, in a regular stratum, having a fixed relation to the rest, but in masses of irregular form imbedded in dark colored or ochreous clays. These masses are often of enormous magnitude, and are either partially exposed at the surface, or covered with a variable depth of earth. The excavation at M'Call's quarry, which is nearly all in solid gypsum, is about 25 feet deep, 50 feet long, and 15 wide; and from borings, it would appear that this solid mass of gypsum, is more than 100 feet in depth. In the neighborhood of Buchanan's banks in the valley of Walker's creek, extensive exposures of it occur upon the surface, but no very large excavations have yet been made. Small openings have been made at various other points, and though the plaister has always been found in great abundance, the want of capital has prevented extensive operations from being attempted.

Some idea may be formed of the immense amount of gypsum contained in these valleys, from the fact that in the borings for salt water which have been frequently made near the Holston, fragments of this rock have been brought up from the depth of 700 feet. Indeed, there seems to be every reason for believing that it extends to great depths throughout a large portion of the region in which it is found—sometimes in masses of enormous dimensions, and sometimes in small fragments and thin beds, mingled with ochreous clays and decomposed pyritous slate.

In speculating upon the origin of the gypsum of this region, the readiest explanation that suggests itself, is that which ascribes its production to similar causes with those which gave birth to the gypsum of the tertiary strata of lower Virginia. It has been incidentally remarked above, that *pyritous slate* occurs in fragments mingled with the gypsum and clay, at the salt wells and other places. Supposing the valley to have once been filled with the debris of this slate, and of the neighboring limestones, we would have all the materials brought together which are necessary for the production of the gypsum, while the slate, after decomposition, would become the clayey matrix in which the crystals would collect. This view is rendered more probable from the occurrence, even in the midst of the solid masses of plaister, of fragments of the siliceous rock which skirts the valley on the south. It is at least certain, that the gypsum has not been deposited here as in some other parts of the world, from the waters of thermal springs holding it in solution, since, in that case, it would be found disposed in layers as travertin, and not in the irregular and scattered condition which has been described.

The *brine springs* constitute another valuable and interesting feature in the geology of the Holston valley. Of the stratum from which the salt water is derived, nothing certain is thus far known, although speculations have not been wanting on the subject. By some it has been imagined, that salt, in the solid form, exists at a great depth below the level of the wells; and this idea has been countenanced by the fact, affirmed by many, that granules of rock salt, are sometimes seen in the water as it is pumped up. On this point, however, it may be remarked, that these granules might have existed, dispersed through the mass of a saliferous sandstone, as is the case in some other parts of the world. Be this as it may, the borings and wells have never penetrated to a stratum such as is usually the repository of the salt water, but have gone through successive beds of blue and red clay, and broken slate, all of them mingled more or less with plaster. The two wells now in use, King's and Preston's, are each 212 feet deep. They are very near each other, and are thought to communicate beneath, and are situated a little to the south of the anticlinal line before noticed. The water, raised by a steam engine, is conveyed in wooden pipes to the furnace, two miles distant, where, after the crude impurities have been suffered to subside, by allowing it to rest some time in large tanks or reservoirs, it is transferred to the kettles. Of these there are five double rows, each containing 100 kettles, making in all 500. Thirty thousand gallons of the brine are daily boiled down, yielding an average product of 1,000 bushels of salt, or one bushel for each 30 gallons. The sulphate of lime, which is almost the only impurity in this brine, for the most part adheres to the bottom of the kettles, and leaves the salt in a state of remarkable purity. At the same time sulphurets are formed by the intense heat, which give a peculiar odor and flavor to the residual mass. No muriates of lime or magnesia exist in this brine. Hence it is free from *bittern*, and dries rapidly in the air.

In the strength of the brine as well as its freedom from troublesome impurities, these wells are scarcely excelled by any in the world.

While all the salt manufactured here is of a very excellent quality, there are three grades, distinguished by different degrees of purity. These are—

1. The common salt, which is of a fine grain, dry, and not liable to deliquesce in moist air, but is a little discolored.
2. The table salt, which is beautifully white and fine. This is made by very rapid boiling.
3. The alum salt, perfectly pure, in thin crystals of a satin lustre. This is formed by slow crystalization as the kettles cool.

Looking to the alum salt now made in Kanawha, and the table salt above described, Virginia has just reason to be proud of the pre-eminence she has attained in this branch of manufacture.

From the Silk Culturist.

PROCESS OF MAKING BEET SUGAR.

The attention of the public having been some time drawn to the manufacture of sugar from the beet, and having repeatedly recommended its cultivation to farmers as a profitable crop, we have felt ourselves under an obligation to give them the details of the process by which it is extracted. We have, therefore, examined the best authorities on the subject, and consulted several gentlemen of some practical knowledge and experience in the business, and the result of our investigation is that the process is altogether more simple and less expensive than has generally been supposed. In describing the various processes in the manufacture, we have carefully avoided the use of chemical terms, and substituted language which we hope will be understood by every reader.

There are several varieties of the beet which yield sugar; but the Silesian beet is recommended as the best and most productive. This beet will come to maturity in all parts of the United States, up to the 45th degree of latitude. The soil most congenial to its growth is a light sandy loam, of good depth, and if free from stones, the better. Probably no country in the world is better adapted to the growth of this root than the alluvial meadows on the Connecticut and other rivers of New England. The cultivation, however, need not be confined to valleys, as in most of the hill towns, lands may be found well adapted to its growth. The land is prepared for the seed by deep ploughing and pulverizing the surface. This is best accomplished by ploughing in the fall, and leaving, the land in furrows through the winter. In the spring, the land should be cross ploughed and harrowed, and, if the soil be light, it will be prepared to receive the seed. The seed may be sown as early as the season will admit, broad-cast, or in drills; but ultimately the plants should be from 12 to 18 inches apart. They should be hoed and kept free of weeds—at the second hoeing they should be thinned out, and but one plant left in the hill—the surplus plants may be transplanted to vacant places in the field.

In the extraction of the sugar, the beets must first be cleaned by washing or scraping with a knife, and care be taken that all decayed parts be cut off. They must then be passed through the rasper and be reduced to a pulp—the finer they are rasped the better, as it facilitates expressing the juice. The pulp must then be put into cloth bags, and have the juice pressed out by a screw press. In France they use the hydraulic press; but a cider, or other press, will answer the purpose, and be attended with much less expense. As decomposition commences soon after the beet is out of the ground, and progresses rapidly, no time should be lost in converting them into sugar.

After the juice is expressed, and before it is converted into sugar, it must undergo four distinct and different processes. 1. Defecation. 2. Evaporation. 3. Clarification. 4. Concentration.

Defecation.

The composition of the beet juice does not differ essentially from that of the cane—it combines with the saccharine matter small quantities of malic or acetic acid, wax and mucilage, which must be extracted before evaporation is commenced. The first process, therefore, is to purify the juice, which must be done by neutralizing the acid, decomposing the wax, and coagulating the mucilage, and hence is called defecation. All this may be done by heating and mixing with it the milk of lime in about the proportion of 46 grains troy weight to the gallon. The milk of lime is prepared by slaking quicklime with hot water, and reducing it to the consistence of cream. The juice must be heated to about 160 degrees Fahrenheit, and the milk of lime poured into it and thoroughly mixed by stirring with a stick. After it is intimately mixed, the stirring must be stopped, and the mixture suffered to rest for a short time. It must then be heated to the boiling point, which will throw the impurities upon the surface in the form of scum, when the boiling must be stopped. When the juice has become clear it must be drawn off from below, by means of a cock, or the scum must be skimmed off from the top—care being taken in either case to effect a complete separation.

Evaporation.

The next process in the manufacture is to dissipate the water, which is done by "boiling away," as it is commonly called, but in technical language, evaporation. If in the process of defecation an excess of lime has been used it should be extracted. This may be done by a mixture of sulphuric acid and water, in the proportion of one of the former to forty-four of the latter. This mixture, put in contact with the lime, causes an an effervescence, by which the lime is thrown off, and the cessation of which is a sure evidence that the lime is neutralized. Some manufacturers say that a small portion of lime should be allowed to remain, and others that the whole should be neutralized. As practical men differ on this point, we may safely conclude it is not very material.

The juice is boiled down till it is reduced to about one-fifth or one-sixth of its original quantity. For this purpose pans or kettles may be used; but it will be seen that those vessels which present the greatest surface to the fire, and give the least depth to the juice, will best facilitate evaporation. As the water evaporates, flaky substances will separate from the juice and collect in a white foam on the surface, which must be skimmed off as it appears. To promote their separation, the boiling is commenced with a moderate fire, which is subsequently increased as they disappear. Sometimes the white of eggs beaten, or a little blood, is added for the same purpose. During the boiling, the juice will rise in froth and flow over the top of the pan, unless prevented by occasionally throwing in a small quantity of some fatty substance. Butter is commonly used, but tallow, lard, &c. will answer the same purpose. It not only causes an immediate subsidence, but hastens evaporation.

Clarification.

After being defecated and evaporated, the juice is yet in a degree impure, and the object of the next process is to separate it from its remaining impurities, and hence is called clarification. This consists in filtering it through animal charcoal granulated [burnt bones broken to grains,] and is performed in the following manner. Tubs, or vats in the form of those used for leaching ashes are made of wood or metal, and furnished with a cock inserted near the bottom. The size of the vats is immaterial; but those of the following dimensions will be found most convenient—2 feet 8 inches deep—1 foot 8 inches in diameter at the top, and 11 inches at the bottom. They may be four sided or round; but those made of staves and hooped with iron hoops we should think the cheapest, and on some accounts the best.

A strainer standing on legs, and covered with coarse cloth, must first be placed in the bottom of the vat and filled with the charcoal—about 100 pounds will be necessary for a vat of the above dimensions. The charcoal must then be covered with another strainer and cloth, and the vat filled with evaporated juice, or, as it is then called, sirup. After standing long enough to leach through the charcoal, the cock must be turned and the sirup be slowly drawn off, and the vat re-filled as fast as it is emptied. The charcoal must be changed twice a day; but it may be washed and reburnt, and, thus prepared, it will answer for another filtration. This may be repeated until it is consumed.

Concentration.

The next process is to solidify the sirup, and hence is called concentration. To accomplish this it must be again evaporated until it is brought into a proper state for crystalization. As it is important that evaporation should cease as soon as it arrives at this point, Chaptal gives the following rules for ascertaining the fact. "1. Plunge a skimmer into the boiling sirup, and upon withdrawing it, pass the thumb of the right hand over its surface, mould the sirup which adheres to the thumb, between that and the fore-finger, till the temperature be the same as that of the skin—then separate the thumb and finger suddenly—if the boiling be not completed, no thread will be formed between the two; if there be a filament, the boiling is well advanced; and the process is completed as soon after as the filament breaks short, and the upper part, having the semi-transparency of horn, curls itself into a spiral. 2. The second mode of judging of the completion of the process is by observing the time when the sirup ceases to moisten the sides of the boiler, and then blowing forcibly into a skimmer which has just been immersed in it—if bubbles escape through the holes of the skimmer which ascend into the air in the same manner as to soap bubbles do, the liquor is considered to be sufficiently boiled."

When the concentration arrives at this point, the sirup must be taken from the boiler and poured into large pans, for the purpose of cooling. The pans must be placed in the air, and the sirup occasionally stirred during the process of cooling, which will be completed in about two hours. On examination, the bottom and sides of the pan will be found covered with a thick bed of crystals, having but little consistence; on the surface of the sirup, a crust will also be formed. To promote crystalization, or, as it is more properly called, graining, a thin bed of brown sugar is sometimes put upon the bottom of the cooling pan, in order to make a nucleus about which the crystalized matter may gather.

After the sirup is cooled and crystalized, or grained, all that remains is to separate the sugar from the molasses, and it is fit for domestic consumption or market. To effect the separation, moulds, as they are called, must be prepared in the form of defecating vats, with the lower end drawn to a point, or so near a point as to leave a hole of three-fourths of an inch in diameter. These may be made of wood, metal or earthen ware, and their capacity may be regulated according to the convenience of the manufacturer. Those used in the sugar factories in France usually are large enough to contain five or six gallons. They are also used in the refining process. Before using them, if of wood, they must be soaked several hours in water, and dried a short time before they are filled with sirup. Thus prepared, and with a cork in the hole at the point, they must be filled, or nearly filled, with crystalized sirup, and secured in an upright position, over a pan or tub of sufficient size to receive the quantity of molasses it contains. After standing from 12 to 36 hours, according to circumstances, the cork is withdrawn and the molasses permitted to drain off. It will at first drain off rapidly; but soon cease to flow in any considerable quantity. To hasten its separation from the sugar, which takes place slowly, the mass must be pierced with an iron spear, by thrusting it into the hole at the point, which will give it vent and cause it to drain off. This operation must be repeated as often as is necessary, and until all the molasses is extracted.

After having remained long enough to have the molasses run off, the sugar is detached from the sides of the mould with a knife, the moulds are set on the floor in a reversed position and left for two or three hours—when, by lifting from the floor and giving it a shake, the loaf will separate from the mould by force of its own weight. The head of the loaf will retain a degree of moisture and a portion of molasses, and, consequently, should be cut off, and thrown into the juice intended for the next clarification. The molasses, also, when a sufficient quantity is on hand, should be again concentrated in order to obtain all the crystalizable sugar it contains. By the foregoing processes the beet is converted into brown sugar, the kind which is consumed in the largest quantities in most families. In the manufacture of loaf, or lump sugar, there is another process called "refining;" but being foreign to our present purpose, we omit it.

From the Silk Culturist.

PHILADELPHIA MEETING, FOR ESTABLISHING A SILK FACTORY.

A meeting of the friends of the culture and manufacture of silk, held at the room of the Board of Trade, agreeably to public notice, on Tuesday evening, the 27th day of December, Nicholas Biddle, Esq. was called to the chair, and T. P. Hoopes appointed secretary.

The meeting being thus organized, was addressed by Richard Peters, Esq. who, after stating its objects, &c. read the report, which will be found below, and which was unanimously adopted.

Mr. Kempton then read articles of association, which were also agreed to.

It was then on motion of Mr. Sharpless, resolved that a committee of five be appointed to receive subscriptions for the stock of a company, according to the terms set forth in the articles of association. Whereupon the following persons were appointed to compose said committee, namely: Richard Peters, Caleb Cope, S. C. Cleveland, Moses Kempton and S. B. Hibler.

The following preamble and resolution were then offered and adopted.

Whereas, it may be advantageous to the company about to be established, to enter into negociations for the purchase of the machinery and establishment of Messrs. Upton and Jackson, before the company shall be incorporated, *resolved*, that if one thousand shares of the stock shall be subscribed, the commissioners authorized to receive subscriptions for the stock may enter into an arrangement for the said machinery and establishment, and advance such funds as they may find requisite, before the charter of the company shall be obtained: the contracts and arrangements made by the said commissioners to be binding on the company when it shall be incorporated.

Report.

The committee appointed at a meeting of the friends of the culture and manufacture of silk, held on the 15th day of November, 1836, to take into consideration the proposition to establish a company for the manufacture of silk, in or near the city of Philadelphia, and for the promotion of the culture of silk; to be incorporated under the authority of the acts of assembly, for the promotion of the culture of silk, report—

The committee have, as extensively as the time and opportunities have permitted, examined the subjects confided to them. That it would be a great national benefit, if silk should become an article of general production in the United States, and that if it can be profitably manufactured in our country, it will give employment to a great number of persons, are truths universally admitted. The culture of silk by raising the mulberry tree, and feeding the worms, which produce that beautiful article of luxury and comfort, will not seriously interfere with the general business of the agriculturist; or require such a portion of the farm labor as will, to any material extent, diminish its usual productions. The mulberry tree flourishes best in cultivated fields; and one of the most approved methods of obtaining the leaves for the food of the silkworm, is from mulberry hedges, which may be made, and securely used for the division of a farm into fields, instead of the usual fences, much more costly, and always exposed to injury and decay.

The periods of the year in which the silkworm is fed, and when only the attention of the farmer and his family is required for their care and management, are those in which the usual labors of a farm are, for a great portion of these periods, not very great; and a large amount of the attention and industry which are required by the silkworm when feeding, and making the cocoon, are most properly furnished by females, and by children from 14 to 16 years of age. In the winter season, the family fireside of the farmer, now comparatively without employment, may be engaged in reeling the silk from the cocoons; a most agreeable and profitable occupation for that part of the year.

The committee have indulged in these remarks from the gratification, it is believed, they will afford to see introduced into the middle and northern states, an article of profitable production and manufacture; which they do not hesitate to say will, at no distant period, rival the abundant products of the cotton and rice fields of the south, and which will call into action and advantage a large amount of free labor. In the moral influence of these results, all will rejoice. The south will be pleased to receive in exchange for her rich and necessary productions, the useful and ornamental silk fabrics of her associated sisters, and the prosperity of the whole union will become equal. The best security and the firmest bond for the preservation of that union, vital to the existence of the nation, are general and equal prosperity.

The committee submit a brief outline of the prospects and advantages which will result from the establishment of a silk manufactory.

As to the prospects of obtaining silk for manufacture.

Within the last two or three years the planting and raising of mulberry trees, and the production of cocoons, have become objects of much interest in almost every state in the union. In Pennsylvania there are now hundreds of acres planted with mulberry trees, from which cocoons will be obtained in the coming year. These plantations will be increased, when it shall be known that a certain market exists for the cocoons, and for reeled silk, at a fair price. Small lots of cocoons are offered daily, and the committee entertain the belief that in 1837, one-fourth of the supply for a manufactory of a moderate extent, can be obtained from American cocoons. In three or four years, a manufactory, with machinery and buildings, requiring a capital of $100,000, may be supplied with American silk. The favorable situation of Philadelphia, communicating by her internal improvements with vast fertile regions of the west and the south-west, increases the confidence of the committee in these anticipations. The climate of Pennsylvania, and of much of the countries to the west and south of our state, are as well adapted to the culture of silk, as any in the world.

The quality of silk obtained from cocoons of American production, is equal to that of Italy, and the abundance and low price of lands, assure us that its production will cost no more than in Europe; and the committee believe it will cost much less. At present a large profit is obtained by the production of silk at $3 per pound. Hereafter it may become more profitable to purchase the cocoons, or the reeled silk, thus prepared in the family of the farmer, than to purchase cocoons at 25 cents per pound, as they now sell. Three hundred and ten good cocoons make one pound, and eight pounds of cocoons will give one pound of reeled silk. At that rate, the reeling being done at the manufactory, the cost of the silk will be about $3 per pound. When cocoons are produced in abundance, the committee are disposed to believe that at twelve cents per pound, the raising them will be as profitable as growing cotton at nineteen cents per pound.

For two or three years after the establishment of a silk manufactory, it must be in part supplied by foreign raw silk. This can always be readily obtained. Large quantities of raw silk are imported into the United States, principally intended to be exported to Mexico, where it is manufactured. Any portion of this can be arrested on its way, and used here, and the constant and rapid intercourse with England and Italy, will always secure its import, as it may be required, in a short period of time.

The present prices of foreign raw silk, are Bengal $3,25 to $6,00 per pound. China, $5,50 to $6,00. Italian, $6,00 to $7,00 per pound.

The amount of manufactured silks imported into the United Staies, in the year ending on the 30th of September, 1835, was $17,497,800.

Silk is manufactured in France principally by adult labor; but the introduction of machinery in the manufacture of silk, which is in the ratio of 90 per cent. in the hundred, reduces the cost of manufacture from 50 to 80 per cent. England, by the use of machinery, has become the successful rival. of France, in many articles of silk manufacture Let the ingenuity of America be applied to silk machinery, as it has been to the machinery for making cotton and woollen goods, and its success will be the same. The higher cost of adult labor in the United States, will thus be rendered comparatively unimportant.

The cost of a manufactory, and the amount of capital necesary to conduct it, will depend much upon the extent of the building, the cost of the ground, and the amount of silk to be manufactured. The expenses of machinery are not heavy, as silk machinery is always light in its construction, and requires no great power to keep it in motion. A six horse power steam engine will move the machinery to manufacture two hundred pounds of raw silk per week; and a building of 30 feet in width, by 225 feet in length, 3 stories high, will be sufficient for all the purposes of manufacturing, dyeing and packing that quantity of silk within its walls. It is proper also to observe that the expense of machinery will depend much on the kind of work to be done. Many articles manufactured from silk, require machinery of but little cost; and the estimate is made with confidence, that an establishment for the manufacture of silk into plain and ordinary articles, will cost no more than about one eighth of a cotton factory, to turn out the same number of dollars worth of work, and with equal if not greater profit.

While it is claimed that all articles made from silk can be manufactured here, it is not considered desirable at present to undertake the making of any but plain staple goods; such as floss and sewing silks, twist and stuffs for gentlemen's wear, vestings, plain ribbons, and grey silks for printing pocket handkerchiefs.

Floss and sewing silk made from Bengal silk would cost—

Raw material, say	$5,25
Dyeing, manufacturing and waste	1,50
Lb. of 14 oz.	6,25
These articles are now worth,	
Sewing silk,	10 to 11
Floss,	11 to 12

Made from American cocoons they would cost $5 per pound. It is estimated that grey plain silks, and white pongees can be made as good as imported from Canton by hand looms of Bengal silk, to a profit at the present prices of the article in the market. When made by power looms, and with American silk, they will yield a profit of not less than 30 per cent.

A manufactory established in or near Philadelphia, may make, when required, any articles which fashion shall demand, and which will always pay large profits. Such articles cannot be imported from Europe before the season of their demand will pass away. Blue sewings, floss silk, grey twilled and plain goods for printing handkerchiefs, articles for gentlemen's wear, are of permanent demand, and will produce from 20 to 25 per cent. profit. The amount of sewing silk used in the United States is immense. To manufacture enough of this article to supply the demand, almost any amount of capital could be employed, with little cost of machinery. It has been ascertained that in the town of Hartford, Con. the sales of sewing silk amounted in one year to $35,000.

The committee consider that $20,000 will be abundant capital for the first operations of a silk manufacturing company. Prudence and experience enjoin that a large sum should not be laid out in buildings. These may be purchased and extended, as the prospects and prosperity of the company shall warrant. Machinery of ample sufficiency to manufacture many articles properly, and the expenses of the manufacture of those articles, with a sufficient stock of raw silk, will be at the command of a capital not exceeding $20,000.

In Philadelphia for some months there has existed a silk manufactory, conducted by Messrs. Upton & Jackson. It is in Stamper's Alley, near Second street. The machinery was made principally by the proprietors of the establishment. The committee have made inquiries into the characters and skill of these gentlemen, and their results have been entirely satisfactory. They are men of excellent moral deportment, and appear to be well acquainted with all the branches of the manufacture of silk, and using machinery for the purposes of ther production. It is highly interesting to visit that manufactory, and to witness the success of the operations conducted in it.

Messrs. Upton & Jackson are desirous of extending the manufactory of silk beyond what their present capital will enable them to accomplish. They are willing to dispose of their establishment to a company with sufficient capital, and to enter themselves into the service of such a company, on very liberal terms. They will pass over their lease in the buildings, and their machinery, to the company at a just valuation, and become manufacturers of silk and superintend the preparation of machinery for the company, for a fair compensation. The estimate they have made of their property is about $8000; and as evidence of their confidence in the success of a company, they will take stock to the amount of $5,000 in part of payment of the amount at which their property shall be valued, by persons mutually chosen and agreed upon by them, and the company.

Possessed of the machinery of the establishment of Messrs. Upton & Jackson, and assisted by them in its business and operations, a company may at once enter profitably and extensively into the manufacture of silk. The experience of Upton & Jackson, and the results of their operations, which have been carefully examined, and ascertained by some of the members of the committee, authorize these assurances.

The committee recommend the formation of a silk manufacturing company forthwith, to be incorporated under the laws of Pennsylvania; and they have prepared articles of association, which they submit with this report.

S. C, Cleaveland,
Moses Kempton,
R. Peters,
Caleb Cope,
William Neal,
F. Dusar,
C. F. Hœkley,
Garret Newkirk,
George A. Snyder,
Samuel C. Atkinson,
Committee.

IMPORTATION OF GRAIN.

According to a statement in the New York Express, there was imported into New York, during the month of November, from European ports, 29,878 bags and 17,900 bushels of wheat, and 14,912 bags of rye! The greatest part of these large importations from the cities of Hamburg and Dantzic.

ON THE CAUSES OF THE LONG-CONTINUED DECLINE, AND GREAT DEPRESSION OF AGRICULTURE IN VIRGINIA.

No. II.

Causes presented in errors of practice. Remedies proposed.

To the Editor of the Farmers' Register.

Suffer me now to attempt the elucidation of various other powerful causes which have continued to prostrate every branch of Virginian husbandry. One of a most formidable character, resembles the disease in wheat, called "the stud" or "the standstill," which effectullay stops all growth. It is the existence among us of a numerous class, most happily characterized, if I mistake not by the poet Burns, as "*the gin-horse tribe.*" Their peculiar distinction is, to tread the same eternal round—the same uniform routine in all their agricultural operations, without deviating a hair's breadth to the right or left, which they have trodden from their earliest recollection, in pious reverence for ancestral usage: to feel and express an utter scorn for every thing they call "book-farming;" to be unmoved by persuasion—impregnable to argument in favor of experiments; and as fixed as fate in adherence to their own antiquated notions of husbandry. But although they are thus insensible to every thing like improvement in their profession, they have not been equally obstinate in resisting the contagion of that lavish expenditure with which modern fashions have infected our whole community. The consequence is, that having done nothing to increase agricultural income, which necessarily diminishes without constant efforts to augment it, and having fallen into habits of far greater expense than comport with their unchangeable notions on all agricultural subjects, they either join in the general cry, that the landed interest of Virginia, which they have never raised a finger to aid, is fast sinking; or they are swept off to new and strange lands by the general torrent of emigration which, of late years, has been desolating some of the fairest portions of our native state, until few, comparatively speaking, are left to do her reverence, or to assist in restoring her to something like her former national rank and importance. Peace and comfort be with these good souls! who, like Dean Swift's henpecked husband, are "*too wise to take counsel, too proud to take warning.*" But nothing can rescue them from the stigma of having contributed more than their full share to all the evils under which Virginia agriculture is now so severely suffering.

Another widely extending cause of our decline is, that even those who profess full faith in the vast improveability of Virginia agriculture, both as an art and a science, do not evince the sincerity of that faith by correspondent works. With very few exceptions, ours is a "dead faith." We promise much, but perform little. But few, comparatively speaking, either subscribe for, purchase, or read agricultural works. Still fewer of those who go a little beyond "*making both ends meet,*" at the end of the year, ever apply as much as a single cent to the improvement of the lands already in their possession; but lay out the whole overplus beyond necessary expenses, in buying more land or negroes, without ever making the least comparative estimate of the profits arising, or likely to arise from the two modes of investment. The great majority, however, of our farmers and planters—a majoritity probably amounting to three-fourths of the whole, are such wretched economists—such slaves to the fashionable and ostentatious prodigality of the time, that, although truly desirous to improve their farms, they have nothing left, at the year's end, wherewith to improve them. The entire income is consumed in supporting a style of living to which, generally speaking, it is far from being adequate—a style which each son, should there be a dozen among whom the patrimonial estate was divided, feels a silly family pride in attempting to maintain, out of his single portion, as his father did before him when in possession of the whole property. The habits of profuse hospitality, contracted under the paternal roof, are still indulged, until no escape from ruin seems to be left but the abandonment of their native homes. Could the danger of this painful event be foreseen in time, it might often be guarded against by a prudent retrenchment, and increased attention to their farms; but having been in the constant practice of "*burning their candle at both ends*" as it were, without appearing to think or to care much how the flame is to be fed and kept alive at either end, they never become aware of this double exhaustion until they are forced to see the last flickering indications of its rapidly approaching death. The next thing, of late years, has been to sell out the little property which is left, and to flee from their homes, their country and their friends, never to return.

Another prolific cause of our depression, but of quite an opposite character to the former, is, that many of our most wealthy agriculturists withdraw large portions of their funds from the culture and improvement of their lands, for very different purposes. Among these, numerous instances occur of gentlemen who, not content with what the *surface* of our good mother Earth will yield them, when properly manage4, have gone to digging deep into her *bowels* after hidden precious treasures. Many much poorer men are thus tempted to quit a certain business, that they understand, and by which they have lived in comfort, for one of which they are utterly ignorant; and one moreover that has so much guess-work in it, as to mar many more fortunes than it makes.

A still more numerous class of our agricultural fraternity, although busily employed *above* ground, instead of cultivating and improving it for income, waste most of their time and money in the generally abortive attempt to amass riches by raising what are technically called "*blooded horses*," as if other horses had no blood in their veins! I use the term *waste*, because the calculation I have heard, is, that not more than one in twenty of these patricians, or noblemen of the equine genus, ever turns out to be a tolerable racer. This calculation, if correct, at once presents a lottery with at least twenty blanks to a prize, even where the horse is good, to say nothing of the greatly increased chances of loss from want of skill in the owners, and from the mal-practices often resorted to against them: a lottery moreover, wherein hundreds upon hundreds of our infatuated brethren are constantly gambling; at an expense too, that even to the winners, is very rarely, if ever, fully reimbursed!

Take notice, my friends, that I am now considering racing merely as a matter of *finance*, affecting our own interests; but on that account, if on no other, well entitled to the most mature consideration of all agriculturists who either *are* or probably *may be* infected with the passion for it. Not a word shall I say of its effects upon the agricultural industry and morals of the country; but will simply ask that a full and fair estimate be made, (I care not by whom,) of the number of winners compared with that of the losers—that of the nett profits made by the former—and if it does not justify my assertions, I will submit to any punishment, to which a jury of honest racers would condemn me.

Let the possessors of what they consider redundant wealh—of money that burns to get out of their pockets—of which they prefer to spend in this way above all other modes; let *them* rely for its alternate transfer, upon the "*heels*" or "*bottom*" of their horses, combined with their own tact in the racing art. I neither have nor ever had any lot or part in such pursuits; but having witnessed, with the deepest regret, much of its baneful effects upon agriculture, I deem it an imperative duty, on the present occasion, to warn all my brethren against its fascinating influence. It resembles all other fascinations in its power to nullify the plainest suggestions of common sense—to silence and defeat the most impressive warnings of that conservative principle, conscience; while it unfits a man from pursuing agricultural occupations with either pleasure or profit, quite as certainly as the constant habit of drunkenness would do.

Now suppose that, of the enormous sums literally thrown away by all who draw blanks in these gold-searching, copper-searching, and racing lotteries, only a moity were laid out in clearing, ditching, draining, cultivating and fertilizing their farms, and in purchasing the best machines and implements of husbandry—can any man in his senses for a moment doubt the great and certain improvement which would rapidly succeed such a change in the application of agricultural income? Surely no such person can be found. This however, is far from being the only misapplication or waste of revenue on the part of wealthy Virginia farmers and planters, exhausting their means for agricultural improvement, and at the same time augmenting the necessity for it, as well as a distaste for an occupation that supplies income far too slowly and moderately to keep pace with the rapid increase, among us, of luxury and prodigality. Their revenue, like Squire Acres' courage, "oozes out at the palms of our hands," for such a variety of other purposes than the good of our profession, ascertainly to produce, very soon, that excess of expenditure over income, which no profession, trade, nor calling, however lucrative, can long sustain without ruin. Yet with this fact staring them in the face, thousands of them continue to act like those thoughtless, silly children who always appear to expect that "*they can eat their cake and have it too.*" To give you all the proofs, within my own knowledge, of the truth of this assertion, would require a pamphlet instead of a letter. I must therefore confine my remarks to those other causes of our agricultural depression which I have yet to notice. Among them, the credit system, since the general establishment of banks, has operated most perniciously; although it has been highly beneficial to a great majority of poor, but enterprising, industrious, and prudent merchants, mechanics, and other trades people. The reason is, that the latter always borrow money to increase their capital; whereas the former borrow it, with very few exceptions, comparatively speaking, to spend in costly show, extravagant living, or gadding about the United States—they scarcely know or can tell for what. Hardly any of these loans are negotiated either to improve or add more land to their farms; and the deplorable consequences are every where visible to any man who will travel thirty or forty miles through Virginia, in any direction whatever.

Another of these causes is one which is the more mischievous, from the circumstance that its effects are indirect—not well understood—and therefore but little, if at all noticed. It is the failure to keep accurate farming accounts. Indeed, there are not more than half a dozen farmers and planters in the whole circle of my acquaintance, who keep any such accounts at all: yet there is not, probably, *one* of them who would not acknowledge, if he would answer candidly, that the success of every trade, profession, and calling, in the civilized world, depends, in a great measure, may I not say, almost entirely, upon the constancy and fidelity with which this practice is pursued by all its members. It would then be strange indeed, nay marvelous, if agriculturists could neglect it totally, and yet could prosper. But they are perfectly content, it seems, with their own management of their estates, and deem it quite a sufficient proof of their thriving condition, if, after paying all expenses, they should find, at the end of the year, that they have *money left in their pockets;* although they are as ignorant as the laborers who made it for them, whether this residuum be only a quarter of one per cent. on their capital, or the largest per centage which agricultural pursuits, in our state, are capable of producing. The consequences of this utter ignorance as to the exact amount of profit, are perfectly plain and intelligible. There is no inducement to vary their crops, their culture, or any other part of their management, because, for the want of these accurate farming accounts, it is impossible to tell in what respect a change, if any, could be made to the greatest advantage; and therefore nothing called *improvement* will be attempted, lest their 'vessel," (to borrow a nautical expression,) 'should miss stays." I have a deep sympathy for this portion of my brethren, for, to tell you the truth, Mr. Editor, I have been as great a sufferer from this cause, (the failure to keep farming accounts,) in propertion to the extent of my property, as almost any other man that can be named—a sufferer moreover, who cannot conscientiously urge the usual plea, that he erred without knowledge of his error; but on that very account the better qualified to warn the less experienced of his fraternity against the evils which he has brought on himself. And here, by the way, permit me to attempt the correction of a very false and prevalent opinion, which is, that no man's advice is worth a rush who does not practice what he preaches. Now the notorious truth is, that *wrong-doers*, after they come to their senses, are far better qualified to point out all the evils of such conduct, than those who never did wrong in their lives. Just as a traveller who is perfectly familiar with *bad roads* can guard others against all their dangers, infinitely better than any person whatever, who never travelled any other than *good ones*. This, Sir, is *my case* in regard to most agricultural matters, and therefore I claim to be heard "as one having authority." The privileges of a repentant offender are certainly mine, whatever they may be; and although I may have urged them too late for my own pardon, yet, if my confession, or advice, can benefit a single individual, among the thousands who have a deep interest in it, I shall be perfectly satisfied.

The last cause I shall mention of our agricultural depression, is, the growing practice of converting slaves into overseers of their fellow slaves. Although it has not become so general as to have attracted much attention, its ill consequences are too plain not to be manifest, on the slightest consideration, to all but those who suffer themselves to be deceived by a few exceptions to the common sense rule which forbids the practice. The objections are, that if not constantly under their master's eye, which cannot be, when fixed on distant farms, they will either combine with their fellow slaves to defraud him, or, should they attempt to be faithful, will excite against themselves such jealousy and hatred as effectually to prevent their exercising that kind and degree of authority which every overseer must exercise to be really useful. This is almost impossible; for, be it remembered, that every overseer, in the absence of his employer, should be, in fact, as well as in name, *his* deputy or representative, vested with equal power to direct and command, and with equal power to enforce his commands, as to all the operations of the farm which he superintends. But this cannot be unless the overseer is quite as free a man as the employer himself. Nay, more—to be worth any wages, only a few dollars more than the pay of a day labourer—to be, in fact, at all fit for his office, he should know, not only how to read, write, and keep common accounts, but he should have considerable experience in the practice, and some knowledge of the principles of agriculture, as well as sobriety, industry, and honesty; qualities and acquirements which, if any have found generally or at all, in negro-overseers, I can only say, they have been much more fortunate than myself.

But I have a word or two to add against free, white overseers, which I would not venture even to whisper, were I in the slightest degree infected with the widely-spread disease of popularity hunting. Many of this class I have highly respected for their good qualities, and some I have been fortunate enough to rank among my friends. Here, however, my praise must stop, and I must enter on the far less grateful task of condemnation. Among the multitudes who seek "*overseering*," (as 'tis called,) the number is very large whose antipathy to every thing like hard manual labor is quite as great as that which cats are said to feel against cold water. Hence, their eagerness to procure such a refuge from what they so much dread, will always be proportioned to the extent of their fears, lest they should be compelled to encounter the object of their dread; and the paltry wages which many of them will offer to take, afford generally a very good measure of their antipathy to it. The unfairness of undertaking a business of which they have no experience, and for which they possess scarcely a single qualification, seems to form no part of their calculation, but to be deemed a matter solely for the consideration of the person to whom the tender of service is made. If *he* is fool enough to be tempted by "the very, very cheap terms" proffered for his acceptance, all is well—and the installation into office soon follows. Now admit, as every body will, that a large portion of them are honest, and suppose one of them to have charge of 20 to 30 laborers,—what can he, what will he do? Having no experience whatever, in directing the labor of others—not the smallest knowledge, even, of the first principles of agriculture—equally ignorant of the great art and immense advantages of dividing and applying most beneficially, the labor put under his control he is utterly at a loss, although choke full, perhaps, of *good intentions*, how to act, and consequently can do little else than give his bodily presence—that, probably, being the sum and substance of his official duty, according to his notion of it. Instead, therefore, of being actively and continually engaged, during the day, in planning—assigning to each negro the work he is best fitted to perform, and seeing that it is executed with dexterity and dispatch, his occupation is of quite a different character. Do you seek to know what it is? Look out for some log or stump most suitable for a seat, and should you not behold him squatted there, you will certainly find him not far off, perched very comfortably upon the fence, looking on in profound silence, and with fixed attention to ascertain that the negroes are all "stirring about," their mere loco-motion being the chief proof he wants, or can understand, of their being usefully engaged in the work before them. What must Virginia agriculture be—to what point of depression—must it not inevitably sink when such is the unexaggerated character of very many of its supervisors and directors? Let others give the answer and govern themselves thereby. I will only add, that if those who employ overseers wish to derive the greatest advantage of which the practice is susceptible, they *must* unanimously resolve to elevate the standard of qualifications. They *must* require much higher moral endowments—more agricultural experience—more agricultural science—more tact in the management of slaves and slave labor; but above all, they must fall upon some plan—for they have none at present—to interest these overseers in the permanent improvement of the farms which they superintend. This is so far from being the case under the present system, that they are made to have an interest directly the reverse, by engaging them for a year at farthest, or as mere occupants at will, and allowing them either a part of the crop, or a fixed sum, often unconditionally. Had the first been a scheme contrived for the special purpose of tempting—nay, bribing men to exhaust the farms put under their care, it could not well have been more ingeniously devised. But the second is not much better; for it is totally deficient in holding out any inducement to fertilize and otherwise improve, although it is divested of the direct temptation to exhaust your lands. Where standing wages are given, why not offer something additional—not only for every bushel of grain which may be made, over a specified quantity—but for every acre of land manured in a stipulated manner, and for the increase of each kind of farming stock. If there are any objections to this suggestion, except a little increased trouble to lazy farmers and planters, I cannot perceive them; and will here close my long and disheartening enumeration of the various causes of our agricultural depression in Virginia. In regard to some of them, there will probably be a difference of opinion among my agricultural brethren; but I must believe, until proof is offered to the contrary, that the difference, if any, will be chiefly, as to their comparative power and efficiency in producing the evil. That all have their share, I think, will be universally admitted, and therefore I will leave it to others to decide which is the most destructive.

I would here take my leave, without attempting to offer any remedies for the crying evils which I have labored to expose; but I fear a similar reproach for the omission, to the one received by the valorous knight, Don Quixote, from his faithful Sancho Pança, who, having fled to his master for comfort, after a very severe beating with sticks and poles, obtained no other consolation than a learned exposè of the true cause of his great bodily pain. Suffer me, therefore, to trespass on your patience a little longer, while I venture to prescribe some method of cure for the nearly fatal diseases whose origin I have taken so much pains to investigate. As no political party-influence, (thank God,) can compel any body to swallow my nostrums, I can make bold to offer them, free of cost, to all who may be disposed to try them. Those of a political character have already been suggested, and may all be comprised in this single sentence. Let us vote for no man, hereafter, but open, avowed, intelligent friends to agriculture—men whose interests are similar to our own—men who will prove their faith by their works. Do this, and we should very soon receive all the legislative aid that we should ask, or ought to be granted. The remedies which I would propose for our other evils, may perhaps, appear to others of more doubtful efficacy. Still I will state them, in the hope, that should they be deemed inadequate, my effort may induce some more competent advisers to recommend others, which may be more generally approved and adopted. The first is one which, I feel perfectly assured, would secure the application of all the rest; but to prepare it, must be a work of time. It is, to give to all our sons, without exception, the very best education we possibly can, and to make sound moral instruction the basis, the corner stone, the central arch, of the whole structure. To those, especially, who are designed to follow our own profession, we should give a familiar knowledge of agriculture, both as a science and an art; and should make them well acquainted, particularly, with all those branches of learning that are intimately connected with their occupation. They would thus acquire a taste for it, while such a course of education would elevate their profession, not only in their own estimation, but in that of the public, who, instead of suffering their legislatures to neglect agriculture as they heretofore have done, would soon teach them to treat her as the nursing mother of every other class, the chief, the primary source of all national prosperity. This general education, too, would have the happiest effect, especially if sound morals were made the basis of it, in *another* all-important matter—one, indeed, without which no nation can ever prosper to any thing like the extent of which it is susceptible. This effect would be, thoroughly to convince all the various legitimate trades, professions and callings, in civilized life, that they are bound together by ties of interest and amity which nothing could ever burst asunder, but the most reckless, irresistable despotism, or their own utter ignorance of their mutual relations and absolute dependence upon each other, goaded on to perpetrate reciprocal injuries by a degree of stupid selfishness that would disperse a community even of brute beasts. Thus to educate the people of our beloved state, would be the noblest, the most god-like work ever yet achieved in this or any other country; for it would effectually secure both her social and political happiness against every hostile influence. The demagogue—that greatest curse of every regular government—could no longer exist in such a moral atmosphere; for his daily food consists of the jealousies and animosities which he is able to excite between the different classes of society; and all the authors and abettors of misrule would have to troop after or go with him, abhorred and execrated by every patriot in the community. The union of true knowledge, virtue, and love of country would soon be consummated; self-love and social, would both co-operate for the general good; and we might, then, confidently trust, that our free institutions would stand as long as the world endures.

The next, among the remedies within our own power, that I will take the liberty to suggest, is one which I feel assured would give new life to our declining cause, and would soon make Virginia a land to be sought, rather than abandoned; for no state in the union has more natural advantages, nor has any one in our whole confederacy stronger inducements to render them available to the utmost practicable extent. Her salvation, in fact, as an independent state, depends upon it. The plan alluded to is, the establishment of county agricultural societies. It would not be advisable, I think, to have them so large as to give premiums, the policy of which is very questionable. Indeed, the practice, as generally managed, is decidedly pernicious; for the premiums are bestowed, in most cases, without the least regard to the cost of the rewarded article. This causes more or less misapplication of labor in preparing it, while it encourages extravagance instead of economy, in the use of means to gain the reward, and thereby tends directly to defeat the chief purposes which agricultural societies were instituted to promote: these are, to increase agricultural profits—not only by augmenting the productiveness of our lands, but by diminishing the costs of production as far as is compatible with the first object. It seems best, therefore, that county societies, if established, should confine themselves to collecting and reporting all the facts relative to the improvements of husbandry, within their respective limits, which they might deem worthy of public attention; and that they should make their communications, either to some agricultural paper, or to a board of agriculture, should we ever be fortunate enough to obtain one. By such a body they might be still farther condensed for publication, and would, in a short time, diffuse throughout our community, more information relative to all the branches of husbandry, than has been disseminated among us, from the commencement of American independence to the present day. The numerous advantages of such a practice are so perfectly manifest and demonstrable, that I will not insult the good sense of my agricultural brethren by the slightest attempt to point them out. I will only exhort and entreat them to make the effort, at our next April elections, to establish these county agricultural societies, and to make *this* the chief business of the day, instead of spending it, as usual, in angry disputations, about the next set of game cocks we shall send to Richmond to fight our political party battles.

The rest of my recipes I shall throw into the form of precepts; the faithful observance of which, although generally neglected, is quite as essential in making good, successful agriculturists, as obedience to moral and religious precepts is, to make good, moral and religious men. Here they follow.

From year to year, at every season, provide most carefully for the health and comfort of your slaves in food, clothing and habitations; ever remembering, that in all these particulars humanity and economy go hand in hand.

Give no impracticable commands, nor any that will endanger health, limb or life; but never suffer what you do give to be disobeyed with impunity.

Always proportion your punishments, with the strictest justice, to the offences they are designed to correct; but never inflict them when angry, nor ever use whipping, until all other means of correction have failed.

To effect your purposes, use encouragements and rewards rather than coercion, and never forget that as slaves differ in temper and disposition quite as much as their masters, they require different treatment to render them as serviceable as they may be.

Utterly reject the too common opinion that slaves have no gratitude; for quite as many and as deeply interesting instances of it may be adduced, as among the whites, after making due allowance for the difference of moral instruction between the two races.

Never scold, nor use the language or tone of an angry despot, but let your directions or orders always be perfectly plain, concise, calm, and decisive.

Always assign to each hand the kind of work before you, which he or she can do best: no labor will then be lost by improper distribution.

Do every part of your work exactly at the time it should be done to make it most beneficial: then no portion of your business will interfere with any other, for there will be no procrastination, and consequently no over haste, no attempt at the impossibility of fully making up for lost time.

Always provide, if practicable, in-doors work for rainy or snowy weather.

Never work with a tool or implement *in bad order*; for more labor will be thrown away by it, in a few hours, than the tool or implement is worth. Therefore, keep enough extras always *in good order* to prevent any delay in waiting for repairs.

Always feed your horses, mules, or oxen, with ground and chopped food, as a less quantity thus prepared will keep them in far better condition, and consequently enable them to pay, by their extra albor, much more than the extra cost of such preparation.

Free yourself, as speedily as possible, from the agricultural dogma, that whatever work we do within ourselves, "*costs nothing.*" It is quite as foolish as it is false; for it *costs labor*, which deserves, quite as well as time does, to be called "*money.*" This dogma is true only, when no more profitable work is left *undone*, or can readily be found *to do*.

Annually return to your farm something more than mere gratitude for all its yearly good gifts; for it will often pay you double in value for every aid judiciously bestowed on it.

The above enumeration of our duties, as owners and cultivators of the soil, comprises many things which occur to me as essential to success in every branch of husbandry; and could these duties be generally fulfilled only for a year or two, I venture to assert there would be no more runaways from Virginia, but those whose departure she would deem a happy riddance.

Some possibly may object to the foregoing precepts as containing nothing new. The same objection might be urged, (I say it without irreverence,) against the ten commandments. Others, again, may be curious enough to inquire, before they pay any regard to them, whether the adviser follows his own advice. To both these objections, should they ever be made, I could only reply, God help the world and all the people in it, if nothing more is ever to be said or written, but what is *new;* or if no advice is ever again to be offered, but by those who have never "*left undone what they ought to have done.*" To my shame and sorrow, I confess, that I do not belong to that happy, all perfect class: nay more, that if I had a dollar for every time I have erred against knowledge, by transgressing my own precepts, I should probably want no more money during life. For such transgressions by any man, there is no excuse, although there is an obvious cause. This is neither more nor less than the old affair of the frailty we have all inherited from father Adam, of the flesh often proving too strong for the spirit. That such has frequently been the case in my agricultural and other concerns, is the concluding, and I hope, propitiatory confession of your old friend,

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For the Farmers' Register.

HOG RAISING.

It is a maxim in law, that "when the reason of the law ceases, the law itself ceases;" but not so with *custom.* An old national habit is unmeaningly persevered in, when the reason of its origin has long ceased to exist. This remark can find no better practical illustration than in the common mode of raising hogs in Virginia. In the early settlement of Virginia, when most of the forest trees were standing, the cheapest possible method of raising hogs, was to permit them to run at large. The acorns afforded by extensive tracts of woodland, unenclosed, would keep hogs in good condition without grain, or with a very small allowance of it. But since, at least two thirds of the virgin forest of Virginia has been cut down, and the best acorn bearing trees pillaged from the remaining third, hog raising in wood commons has become entirely unprofitable. There is no opinion more common among farmers, or more erroneous, than "that a large wood range will keep hogs in good order, whether it happens to be a good mast year or not." Except the acorn, and woodland is the most inferior range for hogs. Earth worms, green vegetation, and aquatic plants, the ordinary food that the hog obtains when running at large, are found in greater abundance in cleared, than in woodland. A large tract of woodland keeps the hog unceasingly running and rooting, without affording any compensation for his labor—and this tantalizing operation keeps him always poor.

With these few preliminary remarks, I will give your readers, Mr. Editor, my experience in raising hogs. I have been engaged in the business for about five years. The first year, I suffered my hogs to run at large, like my neighbors, in a common, near my settlement, a part of which was my own land. They were fed by a slave every morning, (such was the direction, however,) at a considerable distance from the corn crib and dwelling house. At a little upwards of a year old, they weighed about 75 lbs. average. My mode of management the second year, was but little variant from the first. The overseer personally attended more to their feeding this year, and the hogs were fatter, or rather not so poor, during the whole year; and consequently, I lost more by theft the second, than the first year. I do not recollect the precise number stolen, but distinctly recollect being frequently informed, through the year by the feeder, that "*that another of the fattest hogs was missing.*" At killing time, the hogs of this year averaged some 10 or 15 lbs. in weight more than those of the previous year: they were, however, a little older. This circumstance is recollected from the fact that they were bred by the same sows—and these sows for several years produced two litters of pigs annually, and about a month earlier each year. My third year's trial was pretty much a repetition of the first. They were lean through the year until penned; some were stolen, and when killed, were entirely insufficient in quantity to supply the plantation. Thus, for three years, we failed to raise a sufficiency of meat for the use of the plantation.

In the month of Feb., 1835, (as is shown by an extract from a memorandum book,) I put up about a dozen shoats, recently weaned, that were pigged in the December before. At the same time, I kept my stock hogs, and some others not of the same age, with the penned shoats in a standing pasture, or lot, of about twenty acres. I gave the penned shoats nearly as much corn as they would eat three times a day. They soon became very fat, but were taken with a cough in April; their tongues became black and swollen: they were then turned in the pasture with the stock hogs; their cough soon left them, and they continued to fatten as kindly as when confined in a close pen. I attributed the change in their health to the cooling effect of green food, and to such other diet as the instinct of the animal suggests when running at large. The objections to stye raising, I think, are, that it has a tendency to produce vermin, which are as prejudicial to the fattening of the hog as the most inveterate disease. They are not apt to be supplied with a plenty of fresh water, or with such cooling diet as the hog obtains running at large, to obviate a tendency to inflammatory diseases. Close penning might be perhaps, profitably resorted to, where the greatest care is taken to supply a quantity of fresh water; where their troughs are regularly well cleaned, and occasional doses of powdered brimstone and salt are given to cool the blood and prevent vermin. I should suppose that it was essential to have a shed to protect penned hogs from the heat of a summer's sun.

But to return from this digression. The twelve hogs above mentioned, were killed in Dec., 1835, at a year old, and weighed one hundred and seventy-five pounds a head. I neglected to attend to the most important item in the above experiments: that is, the quantity of corn the several parcels of hogs consumed each year.

I proceed, with more pleasure, to give an account of my experiment in the year 1836. (I should have mentioned that the twelve hogs before alluded to were not of the same stock with my *killings* of the three previous years. They were of the scrub stock of the neighborhood, crossed on the Kentucky hogs.) My stock of killing hogs for this year, (1836,) were littered late in December, 1835. They were enclosed in a fifty acre field during the year—were about twenty in number, and were fed twice a day with a half bushel of corn in the ear at a feed. In the early part of the year, when they were pigs and small shoats, the half bushel was not filled; in the early part of the fall it was rather more than filled; and, during the month of November, their allowance was again increased. Nearly half of the fifty acre field was in woods: a part of the remainder was set in young clover and herds grass. The hogs were killed in November, at a few days less than eleven months old, and averaged one hundred and forty-one lbs. a head. If they had been highly fed through the month of November and December, and killed at a year old, I believe their weight would have been increased nearly 30 lbs. a head.

The items of management variant from the ordinary mode of raising hogs in this vicinity, were keeping the sows fat from the time they became pregnant, until they littered; spaying and castrating at a very early age; keeping the killing hogs fat the whole year; cutting off the *rooter*, or cartilage of the nose; and giving them, frequently, salt and powdered brimstone. I have not lost a single hog from theft, or disease, during the two last years, with the exception of one or two pigs that were littered in severe cold weather. The land grazed by the hogs was but little rooted, and was manifestly enriched by their droppings. They were fed in a small pen kept well littered, and encouraged to sleep in it at night. The manure raised from them is considerable, and seems to be of a superior quality.

I should have mentioned that the killing hogs of the two last mentioned years, were fed, in the summer, partly on vegetables; and whenever they had an allowance of vegetables, their ordinary allowance of corn was curtailed. Having raised a very unusually large crop of tomatoes, they were fed in quantities of half a bushel at a time to the hogs: they ate them very cautiously and sparingly at first, but soon acquired great fondness for them.

I have given you, Mr. Editor, my limited experience on hog raising, and candidly believe that I have much more now to learn of the nature, habits, &c. of this valuable animal, than when I first commenced to attend to the subject. From an experiment accidentally made, I entertain the opinion that the most profitable mode of raising, is never to winter a killing hog; but so to regulate the breeding of the sows, as to cause them to litter about the first of March; and then to feed highly the sows and pigs two or three times a day on grain and vegetable diet, fruit, &c. Hogs well fed, littered in March, and killed in December, may be made to weigh, ordinarily, from 150 to 200 lbs. I have four sows that will litter in a few days, and expect to kill the pigs in December next; when I promise myself the pleasure of communicating for the Register the result of another experiment. My neighbors are introducing improved breeds of hogs, (the Bedford and No-bone,) and are very much pleased, particularly with the former. The Bedford stock keep fat on very little food, and make, I have been informed, excellent *roasters*.

W.

ON THE USE OF HAND RAKES, INSTEAD OF HOES, FOR WEEDING CORN. HILL SIDE DITCHES AND FURROWS.

To the Editor of the Farmers' Register.

Goochland, February 14th, 1837.

As much depends on the time and manner of cultivating any crop, (in order to its success,) and there being a great diversity, both in theory and practice, in regard to the tillage of corn, permit me (after a long interval of silence) to give an exposition of the method of the culture of this most important staple, as adopted by Mr. Thomas B. Gay—who, in my humble opinion, (as a skilful and practical farmer) should be placed among the foremost. I had the honor of receiving a communication from Mr. G., a few days since, which I heartily transcribe, and offer to your readers, hoping, that those accustomed to use hoes, in the weeding of corn, will at once renounce them—convert them into rakes—and have three or four rows weeded, in the time employed in weeding one, with a hoe; and the work much better executed.

He writes as follows: "My mode of cultivating corn, is this. The first operation after the corn comes up, (which is commenced by the time the corn has three or four blades,) I run a new-ground coulter each side of the corn, as near as possible—then with a wing coulter, or some other plough that will raise the dirt higher than the one already used, I run two furrows more, one on each side; (by this operation, the land is thoroughly broken, and leaves, for the rakes, the easy and pleasant task, of cleaning the corn, nicely.) With the rakes, (which are similar to those used in a garden,) I brush over the row, backwards and forwards; which takes away all the clods—leaves the corn neatly hilled up—and has the happy effect of smothering all the grass in and about the corn. As soon as the corn is large enough to thin, I go over, and thin the crop, observing, to pull up any weeds, briers, &c. that may have been left by the rakes. By taking the briers near the ground, they may be extracted with little or no pain to the operator, and is much better done than would be with a hoe, as it generally brings both root and branch. By the time the grass again makes its appearance, the corn will be able to withstand the dirt thrown to it by the wing coulter, or small plough, which may be employed with entire success, in subjugating its growing enemies. The operation of the rake is performed so quick, and it leaves the land in such a nice condition, that I generally go over the second time.

Should the land be flushed, previous to planting, I complete the process, by running twice in each row, with a five-hoed cultivator, drawn by two horses; and subsequently, a large rake, which leaves the land in good order, for the reception of wheat."

That plan seems to have a fair claim to goodness, which grows in our estimation, as our acquaintance increases. "I would here observe, that I commenced using the rake fifteen years ago, and have never thought of weeding corn with a hoe since; and I am confident, that a boy or girl, 12 or 13 years old, can go over more ground in a day, than 3 or 4 men with hoes, and the work will be a great deal better done." I saw the rakes used by Mr. Gay, in operation, last summer, and was truly pleased with the execution of the work. I think a fair trial of them will ensure a discontinuance of the hoes.

From actual experiment, Mr. Gay is taught to believe, that the listing of land, for corn, is a sure remedy against the ravages of the cut worm. He planted corn on land listed last spring, and a piece contiguous that was flushed, on the same day: the corn on the land listed, sustained little or no injury, while the flushed was nearly entirely destroyed. The reason is obvious, which the intelligence of the reader will readily perceive.

Allow me, before closing this hasty scrawl, to ask of your correspondents, if our hill side ditches and water-furrows are not radically defective? I have seen many in my own neighborhood and out of it, which seem to be efficient agents in accomplishing that, which they were designed to prevent. The space between them is frequently so great, that the land sustains great injury, even when the furrows are unimpaired. It is often the case that the excavations, intended to convey the water off, gradually become filled with the very essence of the land, and then breaking, the stream, embracing in its course every successive furrow, "the flood-tide of depletion," increasing in power and velocity, sweeps away the cream of the soil, as with the besom of destruction—telling the constructor, that he has not sufficiently studied his profession—that "the knowledge required to form a competent agriculturist, is as profound as it is various," and that his fortifications stand in need of some additional strength. I believe, when judiciously run, they have a most happy tendency.—Strange to tell, many farmers seem not to recognize their utility, and work their land, as did their ancestors, up and down the hill, (familiarly so called) and seem to conclude, that washing is an inevitable consequence, and that no effort on their part is required to prevent it. I believe, that nature as much designed that we should use means to save our soil, as that we should level our forests before raising a crop. As well might we expect to reap the joys of the conjugal state, when adhering to celibacy, or that the fruits of the earth should ripen beneath the shade, as to preserve our soil, whilst under cultivation, without mental and physical exercise.

As an improvement on the above system, I would respectfully suggest, that, in laying off our lands, (we will say for corn,) we give about three inches fall for every twelve feet, and that, in each ploughing, a furrow be left in each row, (which is naturally done,) whose office shall be to convey off the water in an easy and gentle manner: and when seeding the same in wheat, form a bed of two rows, (say of twelve feet each) leaving a furrow between, that will perform the function for which it was created. When land is once judiciously laid off in this way, it requires not a repetition. It is with pleasure that I can announce to those who may adopt the system, that it was invented, and has been practised upon with entire success, by Mr. G., for several years. I hope the dawning excellence of the plan of Mr. G., may become extensively developed, and rendered subservient to the preservation of our soil. Let us raise high the standard of our attainments, and persevere to the end. There is a perversity in human nature, which makes us relax our efforts, at the moment when they might be rewarded with the most splendid success.

I have thus, in a very brief and imperfect manner, described some of the operations of the farmer: should the present be deemed worthy of notice, I will attempt to describe, at some future period, others, that seem to merit some consideration.

I trust that our legislature will afford speedy and efficient aid to the vital interests of the Old Dominion, and enable her to cast off the habiliments of mourning, and dilapidation, and again put on her garb of youth and beauty. In the language of Mr. J. M. Garnett, their co-operation is essential to the success of our agricultural pursuits. In conclusion, permit me to repeat the sentiment of Mr. G., and say, that the virtuous and intelligent portion of the fair, call forth all the best affections of our nature, by encouraging us in every good word and work; while the greatest blessings of life cannot be half enjoyed without their participation.

R. D. K.

EMIGRATION TO THE WEST.

To the Editor of the Farmers' Register.

Goochland, February 15th, 1837.

Should you deem the following extract worthy a place in your paper, as tending to protract the stay of any of our enterprising and worthy citizens in the Old Dominion, you are requested to give it publicity.

"A thousand airy schemes—bubbles, colored by the excited fancy with rainbow hues—are hatched from busy brains, and skilfully held up before the attracted gaze of the multitude; while the ignorant are entrapped, the credulous deluded, the avaricious caught, with the false hope, that that which is essentially empty, can fill the coffers of them all, and that which is as uncertain as the wind, cannot fail to return them for their mite, a hundred fold.

"The state of our country, with the general character of our people, invites, tempts, urges our citizens, to leave their old business and homes, and especially to desert the quiet pursuit of agriculture, and the toilsome labors of the work-shop, to engage in various speculations, to venture their all upon the fluctuating tide of the stocks, and to roam the earth over, in search of some philosopher's stone.

"And this condition of things is easily accounted for. The very flood of our prosperity, at first, took up some of our fellow-citizens, and without any previous desire, or especial [effort] of their own, bore them on to fortune. The quiet and unambitious proprietors of soil which formerly had been of trifling worth, by the rapid spread of the population, of some sudden turn of business, became instantly the possessors of abundant wealth.—Others, witnessing their rapid promotion, naturally longed to keep even pace with it, and soon began to task their ingenuity to invent and compass means of similar elevation. There is something so extremely fascinating in the gathering up of a sudden harvest of gold; there is something so exciting in the dream of going to sleep a beggar, and awaking a prince, that it is hardly a matter of surprise if a few instances of such rare good fortune, in a community, should turn the heads of half its members." The author anticipates an objection that might be started against his doctrine, and answers it in the following manner: "The doctrine that I would advocate, is no foe to honest industry—it is its firmest supporter—its truest friend. We are encouraged to strive in every lawful way, zealously, perseveringly, for the bettering of our earthly condition.

"Industry, economy, order, the freest exertion of the faculties of mind and body—temperance, justice, and manly independence, all these hang mainly upon an honest and well regulated pursuit of wealth. And, herein, consists the only real worth of that for which all the world is laboring, that, by furnishing the chief excitement to the natural propensity for gain, it developes, and holds in steady action, all the moral influence which proceeds from the lawful exercise of this principle. There is nothing valuable or worthy in the mere possession of property—but every thing in the effect of a prudent, rational, and just pursuit of it. Sudden wealth, is almost certain ruin. Inherited wealth, is pregnant with dangers. But, the gradual advance to it, by the way of economy and industry, this is happiness, health, and virtue."

R.

ON "COUNTING THE COST" OF NEW IMPROVEMENTS—AND APPLIED ESPECIALLY TO EMIGRATION.

To the Editor of the Farmers' Register.

Madison County, February 15th, 1837.

Some of the previous numbers of your Register, being somewhat deficient in original communications, I am thereby induced to offer my annual mite, supposing it more acceptable at this time, when more valuable contributions have been suspended.

I was much pleased and edified by a perusal of your description of the Dismal Swamp. I wish it were in your power to make many such excursions through different sections of the country, and more especially this, where much valuable agricultural information might be *thus extracted*, *orally*, which, otherwise will remain within the precinct of the immediate neighborhood wherever it originated, or was first practised through all time, before one of its possessors would venture upon a written communication, even under a fictitious name. Why this inexplicable course, I know not; but to their shame be it said, such is the fact. Does it proceed from selfishness, or the unenviable ambition to excel others, by concealing, or preventing the circulation of such information? But I cannot even imagine that the human heart is so depraved and lost to a sense of its duty, as to be guilty of such a detestable offence. We must, therefore, attribute it to better, but erroneous impressions; such as distrust in their own qualifications, or to false shame.

The current volume of the Register, page 570, contains a peculiar and valuable communication, headed, "Doubts of the value of some of the opinions now current, on agricultural improvements." I say peculiar, because it differs materially from most communications in its admonitions and warnings to the inexperienced, whilst most correspondents recommend and laud most of the new-fangled schemes of the day, without sufficiently testing their utility. I wish you had many such correspondents, who, like this, in recommending such improvements, would not only point out the advantages, but disadvantages, attending them. We have frequent, and no doubt, highly colored accounts of the profits arising from the culture of silk, the sugar beet, &c. But sir, the disbursements, if alluded to at all, it is done in such ambiguous terms, as rather to delude and entangle the inexperienced, than to point out in plain and perspicuous language, based upon a full and fair computation, the expenditures, as well as the profits. Many estates have been ruined, and for aught I know, souls lost, by thus pointing out the bright, and not the dark side of the picture, by holding out inducements to unsuspecting and inconsiderate youth, to embark in enterprises, (without counting the cost) which promise ease and affluence, but result in total failures, and ruin to themselves and families. Sir, think me not censorious, when I tell you, that I too, have felt the "smart of the rod," I too, have been gulled by my credulity, in such partial and exaggerated statements. I allude now to those made by some of the travellers from the south-western states. Virginia must be almost depopulated, if this fraud be not exposed. Who would remain here, if they could realize half the advantages promised by a removal to the south-west? *I* would not, for one. But, fortunately for me, I have profited by experience, though somewhat costly. I was led astray by those well devised tales—and was induced to visit the south-west, with the intention of making a settlement, and with the sanguine expectation of accumulating a large fortune, in a few years. I had figured to myself, that the profits arising from a well conducted sugar or cotton plantation, were immense—and indeed, they are. But, on my way, I reflected maturely on the subject, and was prepared to make such inquiries as the nature of the case called for: therefore, on reaching the sugar growing country, my first inquiry was directed to the cost of the establishment of a comparatively small sugar plantation, including machinery, &c.—and to my astonishment, the amount exceeded any thing that I had ever conceived of, in Virginia. This satisfied me at once, that none but a capitalist could become a profitable sugar grower. My attention was next directed to the cotton region, with a view of purchasing a cotton plantation, provided I could abide an investment necessary for such a purchase. I had previously determined not to purchase an unimproved plantation, and incur the risk of a fall in the price of cotton, before I could get a sufficient quantity of arable land to make a crop. By an improved plantation, is meant, one that has on it a few log huts, and a small portion of land ready for cultivation: such a one, within the reach of civilization, could not be obtained for less than from twenty to thirty dollars per acre. Now, sir, say for example, that I purchased a tract containing 500 acres, at twenty-five dollars—this would amount to twelve thousand, five hundred dollars. Then add the expense of removing—the necessary utensils, stock, &c. &c., exclusive of negroes, and you would have an aggregate amount of from fifteen thousand to twenty thousand dollars, as a beginning. This I do not consider an extravagant calculation; for upon it, was based my destination, of either remaining in the south, or returning to Virginia. Taking into consideration, health, society, the high price of land and all other commodities, I was not long coming to a decision, more especially when my predilection was so much in favor of Virginia, my native state. I then abandoned all idea of a cotton plantation, and must acknowledge that I feel no regret for the loss of time, or expense of the trip; for I am amply compensated by the information derived, and my increased attachment for the Old Dominion. I do not deny, but that the cultivation of both sugar and cotton is very profitable; but the establishment of a plantation for the culture of either, requires a considerable capital. Many men, of moderate means, who would have the hardihood to involve themselves, and hazard the independence of their families, might establish one, and the experiment might prove successful. But, on the contrary, if there should be a failure in a crop or two, exclusive of other casualties, ruin would be the inevitable consequence. Then, I would say, to the capitalist, and to the bankrupt, to the man of iron nerve and adamantine constitution—"Go to the south; for such alone, as you are, it is eminently adapted." Far be it from me, sir, even if it were in my power, to discourage improvements, or a reasonable emigration; for my only object is, to point out the difficulties and disadvantages attending them, so that "he who runs may read."

This subject was entirely foreign from my intention, when I commenced writing, for I had other matter to communicate, but it has brought me to the end of my sheet, and I must, therefore, conclude.

INCOGNITO.

P. S.—It is not the fear of being responsible for any thing I have written, that my real name is withheld, but the fear of being considered presumptuous, by some of those around me, so much better qualified to write than myself.

I.

ON THE SUITABLENESS OF WARM CLIMATES FOR WINE MAKING.

To the Editor of the Farmers' Register.

Columbia, S. C., February 15th, 1837.

Dear Sir: I have read with much pleasure, in your most valuable Farmers' Register, (No. 10,) the extracts from "an essay on the climate of the United States," and feel disposed to make a few observations on some parts of it.

I shall not try my hand at explaining the causes why the eastern portions of our continent are much colder than the same parallels of latitude on the western coast of Europe. These, I thought, were matters pretty well settled, so far as we can see into them. The causes of the various winds are more unknown, at least to me, and therefore I shall say nothing about them. The author's views relative to the culture of the vine in the United States, come somewhat more within the narrow limits of my studies and experience. It is but too true that "the efforts made at different periods, and in various parts of the country, to attain this object, have hitherto been so unsuccessful, as to induce a very general belief, that there is something in our soil or climate, so unfriendly to the vine, that it can never be cultivated with success." This unfriendliness, it appears to me, is more in the climate than in the soil; and yet, although climate cannot be corrected by us, the soil can be so in some degree, and we might do pretty well, if it were not that much too great quantities of rain fall in this country, during the summer months, particularly in the southern states. In a dry summer, we have good grapes and a tolerable crop, which might be very good in a soil sufficiently calcareous. It would be a most strange anomaly, that the vine could not be cultivated in a country which has, perhaps, more than any other on the face of the earth, indigenous vines growing almost every where, and in very great variety. Although we may, among this variety, find several that may be introduced into cultivation with great advantage to the cultivator, yet, I would not that our efforts be limited to the native kinds, alone—for the cultivated ones of Europe and other parts of the earth, offer advantages which never have been yet obtained from the native one. The exotic kinds, many of them grow very well in our country, and even more luxuriantly than in most parts of Europe. It is so true, that for a long time, I attributed the rot in the grapes, to that very luxuriance of the vines; but, the having planted some, with equal want of success, in very poor sandy land, has much weakened that opinion. I still hope that the remedy, at least a partial one, might be found in calcareous earths.

The author of the pamphlet, whose review I am considering, seems like many other writers on the subject, to think it an insurmountable objection to the making of wine, that the grapes ripen in the hot summer months, and thereby, the fermentation going on too violently, the wine becomes acid. I have made wine when the thermometer was at 90° and upwards, and my wine has never turned acid in consequence of it. I certainly never have experienced any difficulty on this account. But if a due and moderate degree of fermentation could not be obtained in a temperature so high, still the difficulty would be easily overcome. We surely can obtain a lower temperature by digging a deep cellar for it. This is, it is true, an expensive structure; but it is insignificant when contrasted with the profits of the successful culture of the vine.

The author says: "wine, I believe, is never made within the tropics." Very little is made within the tropics, particularly on the eastern part of the globe, relative to our continent; but, the cause of this, is probably more to be sought in the indolence of the inhabitants of warm climates, and also, in the Mahometan prohibition of the use of wine, than in any absolute difficulty. I have now before me a French book—"*Topographie de tous les vignobles connus*," &c. "*par At. Julien, auteur du Manuel du Sommelier*," &c. In this most interesting and excellent work, I find not only great crops of excellent wines are made in Greece, Egypt, Palestine, and still more southern tracts in Africa and Asia; but, I also find the vine cultivated in Arabia, between the 12th and 30th of latitude. It is also found in Abyssinia, and also in several of the Oases of the great deserts. Grapes are also successfully cultivated, and wine made in some of the West India islands. In Guiana, "the vine, the pomegrenate, and the fig tree, are the only fruit trees transported from Europe, which have had success in some parts of the country; but the *grapes rot* during the rainy season, and are *devoured by the insects* during the hot weather." This country extends from the 2d to the 9th degree of north latitude. On the western side of the continent, in latitude south, 8° and 9°, "the province of Truxillo has numerous vineyards in full success." "In the government of Cusco, wines and brandies are one of the principal sources of wealth in the Corregidorship of Callahuas." "In Peru and in the Tucaman, the vine is very successfully cultivated." It is so likewise in many parts of Chili, Mexico, and other southern countries. It is to be observed that, although the wines made in those warm climates are not all of the first quality, yet many are in very high repute, and bear high prices.

From all these facts, we ought to gain courage. We should persevere, and probably, success will finally crown our endeavors. Public aid should certainly be afforded for the purpose of making the many and expensive experiments necessary to insure a prosperous result; for this would redound to the general benefit in morals, as well as pecuniary and political and commercial advantages.

I fear, Mr. Editor, the matter, as also the manner of the above rude lucubration, may not accord with the taste of the generality of your readers; but, yet, I think with you, that if our distinguished and talented men, were to turn their thoughts to agricultural improvements, meteorological studies, and the introduction of valuable articles of culture, and less to party squabbles, &c., we would do much better than we do. While I am waiting for this good change in our views and exertions, I continue to be truly yours,

N. HERBEMONT.

From the Dedham Advertiser.

PROGRESS OF THE SILK MANUFACTURE IN THE UNITED STATES.

Silk was raised and manufactured in Connecticut seventy years since; but for many years the spinning was done on the common hand wheel, and the reeling on a reel, both to great disadvantages. The first regular power machinery used in that state for the manufacture of silk was constructed in Mansfield, in 1829, nuder the immediate superintendence of Mr. Edmund Golding, who came over that year and brought the patterns with him from Manchester, England, where he had worked at the silk business from his earliest childhood. In the same year, (1829) similar machinery was put up in Dedham, by J. H. Cobb, Esq.—and since that time the two establishments of Mr. Cobb and Mr. Golding have probably turned out a quantity of silk goods, larger in amount than all the rest ever manufactured in the United States. These mills were kept running until about a year since, when the original proprietors sold the whole of their machinery to the New England Silk Company—took shares in the stock, and both are now officers of that corportion—Mr. Cobb as general superintendent, and Mr. Golding as the manufacturing agent.

The New England Company's mill, just erected here, is the largest silk mill in America. The machinery, with which it is fast filling up, is of the most approved models, and made in the most thorough and workman-like manner. It is chiefly made here, under the superintendance of Messrs. Golding and Cobb; but the spinning frames are built at Mansfield, by Mr. Nathan Rixford, an ingenious machinist, who assisted Mr. Golding in constructing the first silk machinery which he erected in that town, and thereby became acquainted with the business.

The mill is furnished with a first rate steam engine of seven horse power, built by Mr. Hinckley of Boston. The power has been applied to the machinery this week, and is found to work admirably well. The mill will be in regular operation in a week or two. The number of hands employed will be small at first, but will be gradually increased, as additions are made to the machinery. Mr. John Golding will act as overseer of the spinning room, and Mr. Samuel Edgerly as overseer of the winding room.

By a gentleman who has lately visited the several silk establishments at Hartford, Northampton, New Bedford, Nantucket, and Poughkeepsie, New York, we are informed that the works of the Dedham establishment, besides being more extensive and superior in every respect, are also in a state of greater forwardness at the present time than any of the silk works above mentioned. The work of making and fitting the machinery proceeds slowly in all the mills; and the reason is said to be because so few in this country have any practical knowledge of the business of manufacturing silk, or constructing silk machinery.

From the Essex Register.

A WILD HOG.

The wild hog, that has been for some months inhabiting the swamps in the towns of Topsfield, Danvers and Wenham, was caught on Friday last, by Mr. J. Brown, E. Lake, and others. This hog was not very fat, but in good condition for a wild rover; his weight about 200 pounds; he was found in the middle of Wenham Swamp, in a nest made up mostly of sticks which he had gnawed off. On being started from his resting place, he attempted to make his escape, but was prevented by a shot from the gun of E. Lake, which disabled him so much, that with the assistance of the dogs he was compelled to surrender, and be taken prisoner by the hunters. The hog in the early part of the fall had been in the habit of visiting the cornfields in the neighborhood of the swamp, and his visits were always made in the night. Many fruitless attempts have been made to secure him. On some occasions from 15 to 20 persons, together with a number of dogs, have given him chase. His speed was very rapid, and his strides would measure six feet up hill; he would leap over a wall 3½ feet high with perfect ease.

From the Farmer and Gardener.

PETITION TO THE LEGISLATURE OF MARYLAND, FOR AID TO AGRICULTURE.

[We insert with pleasure the following memorial to the General Assembly of Maryland, and hope that may have the effect of eliciting the attention of that body to a too long neglected interest. There is no question in our mind, but that the time has arrived for action, and that, unless something be speedily done to arrest the downward course of things, this state will, ere many years shall have elapsed, present a spectacle as humilating to the pride of her citizen as it will be fatal to their prosperity and happiness.

The memorial is, we learn, in a course of circulation in the several counties for signatures, and we hope those friends of agriculture who may have charge of it, will lose no time in discharging the important trust confided to them.—ED. FAR. & GARD.]

To the Honorable the General Assembly of Maryland.

The *memorial* of the undersigned, farmers, planters, and those friendly to the pursuits of agriculture, most respectfully beg leave to represent to your honorable body:

That they have, for a length of time, viewed with feelings of profound regret and mortification, the very depressed condition of the agriculture of the state; nor have they with emotions of less pain seen a portion of her population, urged by dire necessity, abandoning the homes of their parents, and the birth places of themselves and children, and seeking new residences in the far west and south-west. Believing, as your memorialists do, that the strength and wealth of the state consist in the prosperity and welfare of its population, and that it behooves a wise and paternal government, so far as in its power lies, to husband, promote, and protect, the interests of its people—and believing, also, that by devoting a portion of the now ample funds of Maryland to the furtherance of objects in which every agriculturist has a deep and lasting interest—nay, in which the pride, honor, and well-being of the state itself is vitally concerned—your memorialists would beg leave to make an appeal to your honors in the hope, that in your wisdom and patriotism, you will see the propriety of granting such relief, as will tend to inspire the husbandmen of this good old member of the confederacy, with renewed energies, and a determination to improve the soil, which must be dear to us all. Thus confiding, they approach you with the firm conviction that it will be only necessary to make their wishes known, to ensure the success of their prayer.

It is known to every well informed citizen of Maryland, that most of her soil was originally fertile, and yielded generous returns for the labor bestowed upon its culture—that her climate is highly favorable to the growth and maturity of almost every species of products—that she is blessed with numerous bays, rivers and tributary streams: but while the undersigned are grateful for those blessings—while they turn upon the past history of the agricultural results of the industry and enterprise of the landed interest, the sad spectacle which is presented by contrasting it with their present disastrous condition, but serves to fill them with the unmingled feelings of the profoundest sorrow. By a course of injudicious cultivation, that soil once so bountiful of the products of the earth, has, to a great extent, been reduced to a state of poverty, which almost forbids the hope of remuneration; and industrious and enterprising cultivators, in innumerable instances, have been compelled to seek *competence*, in far distant places, for themselves and offspring; for the sad reality of exhausted fields, have convinced them, that in the old pursuits of husbandry they can no longer find it at home.

While all parts of the state have suffered more or less from emigration, your memorialists have been credibly informed that from Charles and St. Mary's counties alone, property and money to the amount of nearly one million and a half of dollars, have been within eighteen months removed to the frontier states; and that, in many instances, proprietors have carried off their slaves and other transportable means, leaving their estates not only undisposed of, but absolutely untenanted. The consequences, attendant upon such a disastrous state of things, need not be all enumerated by your memorialists, as they must be as obvious to our honors, as is the fact, that, if this spirit of removal should not be stayed, lands must continue to decrease in value till they shall have reached a price which will prostrate the landed interest—fields which once blossomed with luxuriant vegetation, and rendered their proprietors prosperous and happy, will become forests—our population will be so lessened as to deprive Maryland of her political importance in the scale of states—and when it shall be too late to remedy the evil, we shall have to deplore the melancholy effects of our listlessness and indifference.

Your memorialists would respectfully ask—is there no remedy for this cruel evil? They think there is. It is known to your honors, that the attention of the agricultural community has been, for the last few years seriously called to the importance of cultivating the mulberry with a view of feeding the silkworm, and more recently to that of raising beets with a view of making sugar. For the cultivation of both the mulberry and beet, the soil and climate of Maryland, are most happily adapted. Of the profitableness of the first of these pursuits, France and Italy bear the most eloquent proofs—their husbandmen, from the wealthy land-holder to the more humble peasant, have each found in it a source of great profit; and of the advantages of the culture of the sugar beet, the successful enterprise of thousands of the agriculturists of France and Germany, is the strongest evidence of the truth of the fact that could be desired.

Already the culture of silk, under the auspices and patronage of the governments of the eastern states, has assumed an importance, as an item of agricultural products, that promises to be productive of the happiest effects. In those states, several of the legislatures, some years since, took a just view of the subject, and, by offering premiums and granting bounties, encouraged their citizens to engage in the culture. Thus animated and encouraged by the parental care of those legislative bodies, their agricultural communities entered into the culture with becoming spirit, and now present to their brethren of the other states an example worthy alike of their emulation and praise. While the *farmers* there have seduously set themselves to work to produce the raw material, individual enterprise, and corporations, have been equally busy in building up manufactories for the fabrication of silk goods, thus affording ample markets for the products of their agriculturists. And from the best information to be obtained by your memorialists, they are led to believe that the silk culture in the section of country to which they have referred, has not only been greatly increased, but has been found to be highly profitable; and is likely to prove a source of permanent wealth to those engaged in it. It, therefore, appears to your memorialists, that, if, in a climate and soil like those of New England—the first cold and inhospitable—and the latter, naturally much inferior to that of Maryland—the culture of the silk has been found so eminently conducive to the prosperity of its citizens—surely in this state, where we are so peculiarly blessed with an auspicious sky, and land, either generous or kind, every thing is hoped for, provided your honors who are the guardians of the public welfare, will extend a benificent hand in furthering a branch of labor which offers so many inducements to engage in its pursuit. Various authors who have written upon the subject all concur in representing it as lucrative, and nothing is wanting to urge our citizens to engage in it with spirit, but the countenance and support of the state government. Should your memorialists be asked, why should this be necessary—they will answer, that as it is a difficult task for even the most enterprising and foresighted to abandon old habits and customs, and modes of culture, and that it requires a stronger stimulant than prospective gain to induce the agricultural community of Maryland, they fear, to embrace the pursuit of this branch of industry, unless the legislature, by its fostering care, should offer premiums and bounties to withdraw them in part from the time honored, though profitless occupations of their fathers.

Influenced by such motives, and actuated by kindred principles, with a foresight which is alike honorable to their heads and hearts, the lawgivers of our sister state of New England, have set an example that has already produced a state of things which is as promotive of individual blessings, as it is honorable to the pride of those states, and conducive to their wealth. Nor have they been content to stop in the furtherance of this great interest; for casting their eyes around, and looking to the future, with the forecast of statesmen and patriots, they are there, in all directions, encouraging the culture of the sugar beet, with a view of adding the manufacture of sugar from this root, to the other branches of their industry.

Beholding these things at a distance, and placing a just estimate upon their intrinsic value—properly appreciating their importance to private as well as public prosperity—your memorialists would be wanting in state pride, and deaf to the injunctions of experience, did they not appeal to your patriotism to make an effort to rescue the fame of Maryland and the welfare of her citizens, from the dangers that surround them.

At a period like the present, when the coffers of the state are full—when with a laudable and just ambition she is generously engaged in promoting great objects of internal improvement—your memorialists cannot believe for a moment, that you will withhold your countenance and support from the agricultural community—from that community who is at once the pride and strength of Maryland. And they therefore pray, that your honors will make such appropriations, as will set on foot,

1st. An agricultural school and pattern farm.

2dly. A general state agricultural society, to be formed by delegates from county establishments.

3dly. County agricultural societies, to be voluntarily formed.

4thly. That the state should grant bounties to those engaging to certain extents in the culture of mulberry, making of silk, and in the culture of the sugar beet, and the manufacture of sugar therefrom—and

5thly. That the state should appoint an agent to collect and prepare all available information, relative to the last branch of industry, and that the expense of publication should be borne by the state; which when published, to be circulated gratuitously for the benefit of the people of Maryland.

Another plan suggests itself to your memorialists, the which they submit in all due respect to the superior judgment of your honors, leaving it to your wisdom to adopt either, or to frame some other suitable plan, calculated to answer the proposed end, as to you may seem most fit and proper.

A pattern farm and school for each county, or districts to be laid off by law. At these establishments, the students or apprentices, in addition to the usual avocations of the farm and school, should manufacture the implements of husbandry for their own use.

The capital to be raised by subscription to an incorporated joint stock company, by the inhabitants of the several counties or districts, which should not exceed one thousand dollars for each thousand white inhabitants, and in no county should the capital exceed thirty thousand dollars.

The stockholders, after ten thousand dollars shall have been subscribed in such county, or district, to meet and choose eight managers, and annually thereafter to make a similar election. The state to choose four managers, making in all twelve managers to each incorporated company. These managers to select a headman or superintendent, and all necessary assistants to carry on the business of the farm—and also to appoint a professor and such assistant tutors as may be required.

The managers thus to be appointed, should meet monthly, and give such directions and instructions as might be called for by the interests of the institution.

At these schools students might be admitted, or apprentices taken, in such numbers as might be thought proper, who should regularly serve until twenty-one years of age, and be governed by the same obligations and laws as now obtain in cases of other apprentices.

When any such school or farm shall have been organized and put into practical operation, and the sum of ten thousand dollars actually paid in, on a legal notification to that effect being made known to the state treasurer, he should be authorized to pay into the hands of the treasurer of such association, a sum of money equal in amount to the interest of the capital thus raised by such county or district: or in the event of a larger capital being raised, that he should pay such sum as would be equivalent to the interest thereon, which interest should be paid annually or semi-annually.

The sum or sums of money thus to be raised by the counties or districts, to be exclusively appropriated to the subjects connected with the establishments respectively.

Periodical accounts of all expenditures to be made to the state treasurer, to be by him laid before the legislature at their annual sessions.

All profits arising from such establishments to be biennially divided among the several stockholders, and the property of such incorporations to be exempt from taxation, either to the state or the county in which they may be respectively located.

To your memorialists it appears most evident, that such institutions are loudly called for by the best interests of the state, and they feel confident that your honors will concide with them in the opinion, that the period has arrived when it is imperiously necessary that something must be done. They conceive that, by the establishment of those schools and pattern farms, invaluable benefits will enure to the agricultural community, and to the state at large: they believe that by a judicious arrangement and economy in their organization, and in the manner of carrying them on, no other burthen will fall upon the state than the first outlay, should you adopt the first plan suggested—and in the event of your fixing on the second, that nothing farther than the specified *interest* money will be annually required, as it appears plain to your memorialists, that the *labor* of the farm could, and would be, performed, in the adoption of either plan, by the students or apprentices.

It appears also to your memorialists highly proper, that in these establishments there should be engaged, 1st, a competent and intelligent farmer: 2d, a lecturer upon chemistry, as applicable to the business of husbandry: 3d, a gardener skilled in the proper culture of the mulberry: 4th, a person thoroughly acquainted with the management of silkworms and the conversion of the cocoons into sewing silk, and another acquainted with the beet culture and the mode of making sugar from that root.

The organization of the agricultural societies, which your memorialists propose, could not be onerous to the state treasuries; because the outlay would be restricted by the *interest* of those who should be members of them. In Massachusetts, with the view of stimulating agriculturists to form such associations, the state has generously enacted, that for every dollar subscribed by each of its members, she will give a like sum. The aggregate amount thus collected is, periodically, distributed in premiums—some to the owner of the best cultivated farm of given dimensions; others for the greatest quantity of corn raised upon a certain number of acres. So also, the wheat and rye grower, the raiser of the best crop of potatoes; the breeder of the best horse, cow or hog; the owner of the cow, feed considered, which yields the greatest quantity of milk and butter in a year; the person who raises the greatest number of mulberry trees, and the raiser of the most silk, have each and all their inducements, in the shape of bounties and premiums, to animate them in the noble contest of agricultural rivalry. Your memorialists would further state, that they are informed, that while the annual burthen upon the treasury of the state of Massachusetts is comparatively small compared with the magnitude of the good effected, the happiest results have been produced. Each individual there, engaged in the pursuits of husbandry, feels himself called upon by that ennobling sentiment, moral obligation, to excel his neighbor—and thus, by the excitement of a spirit of rivalry, virtuous in its conception, and holy in its objects and prosecution, have the legislature produced a feeling and a pride, whose benefits are to be seen in the fruitfulness of a comparatively barren soil, and the prosperity and happiness of the people.

With this exposition of their views, your memorialists respectfully ask your honorable body, to take the subjects treated of in this memorial, into your serious and dispassionate consideration, and to grant them such relief as to you may seem meet and proper, and they, as in duty bound, will ever pray.

A FEW DESULTORY THOUGHTS, ELICITED, PRINCIPALLY, BY THE EDITORIAL REMARKS OF NO. 8, VOL. IV, OF THE FARMERS' REGISTER.

To the Editor of the Farmers' Register.

January 7th, 1837.

To show you that your *moving* "appeal" has not been entirely lost upon your readers, I take up my pen, if to effect nothing more, to express my condolence on account of the apathy of which you complain in your correspondents, and to assure you, that *one* at least sympathizes with you under the labors and discouragements which attend your arduous, but useful enterprise. It is said by an authority that is generally respected, that "the husbandman waiteth for the precious fruit of the earth, and hath long patience for it, until he receive the early and latter rain." This example surely, is worthy of the imitation of one whose occupation, as yours is, is to enlighten and animate him in his toilsome pursuits. It must be expected that the "patience" of the agricultural editor will be "long" and severely tried. He speaks to people that are "dull of hearing," and "slow of heart to believe." The theme on which he dwells, to many is devoid of interest, either because they imagine it is not sufficiently *elevated* to enlist their regards, or because their information concerning it, is already sufficiently ample and accurate. Science on the subject of agriculture! What has science to do with a business so ignoble! What? Why as much as it has to do with any *thing* else. To be farmers, men need not be fools, and *ought* not to be ignorant. Their profession presents a scope for the exercise of an intellect the most expanded, and calls for talents as diversified and rare as almost any other: nor when properly pursued, is it behind any secular employment among men, in respectability and usefulness. Of lawyers, and physicians, and merchants, our country has more than enough. Not a few in these callings, are absolutely the pests of society; the fomenters of disgraceful and ruinous schemes of litigation, the *legalized* destroyers of human life, and the ravenous leeches that fatten on the exhorbitant gains that are drawn from the resources of honest and frugal industry. No one in his sober senses can doubt that it would vastly subserve "the public weal," without detracting essentially from the credit of the individuals themselves, were many of them to exchange their present pursuits for the good old fashioned way of getting their bread by "the sweat of their brow."

I should rejoice, sir, to see you efficiently acting upon this numerous, and more than useless portion of our population. Is it not possible for yourself or some one else, to convince them, by bringing forth your "strong reasons," that the business of *planting* is more *noble* than that of *pettifogging;* that *the cultivation of the soil,* (at least upon scientific principles,) is more *elevated* than *quack-doctoring;* and that well directed efforts to increase and improve the substantial comforts of life, are much more commendable avocations, and require a much larger share of intellect, than is demanded for the petty paltry business of vending commodities, many of which are not only superfluous, but hurtful, and at the extravagant rate of from one hundred to one thousand per cent. profit? Could this be done, could this conviction be produced, a desideratum no doubt would be effected, and he who should accomplish it would richly deserve the title of a benefactor—a benefactor as renowned as he who should "make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before."

You may regard me, sir, as a "miserable comforter," but I cannot suppress the apprehension, which I indulge, that your "correspondents" will not be likely very soon or rapidly to increase, your *moving appeal* to the contrary, notwithstanding.—Men, to write much, must be under the influence of some powerful stimulus, as the love of money, or the love of fame, or the love of usefulness.—Now farmers, for the most part, are too modest to expect to become famous as writers. If the accumulation of riches is their object, they have a shorter and surer cut to that; and as to the help which they might afford to others, they would principally and greatly prefer, in the *first place*, helping themselves. It is a pity it should be so, but farmers, like most other men, have not as much *benevolence* as they ought to have. I do not wonder, therefore, that your offer of pecuniary compensation had no greater effect than it seems it did have, in supplying your columns with matter. The most hopeful expedient for the melioration of your condition, and for the brightening of your prospects appears to have been hit upon by yourself; (on this account, I opine, you must like it none the less;) and that is, to "engage the aid of an efficient coadjutor" for "the special purpose" of collecting agricultural information for the columns of the Register. To get *such* a "coadjutor," I suppose, however, is the *difficulty;* and I certainly wish you all imaginable and desirable success; not because I conceive there is any special deficiency in your own qualifications, but simply, on the universally acknowledged principle, that "two are better than one," and that your undertaking is one of too much magnitude to be laid on the shoulders of an *individual*, however gigantic in energies. The burden is too heavy to be borne without division. I am a decided friend to *union of effort* in almost every department of life. Union is the strong cement of society, that gives stability and secures accomplishment to human purposes. "A two-fold cord is not easily broken." "In the multitude of counsellors, there is safety." In combinations of men, each has the benefit of the concentrated wisdom of the whole. If one is thrown down, the others can help him up. Animals as well as men perform their labors with more cheerfulness, animation and effect, when coupled together. I have recently thought it a subject for regret, that agricultural operations should not long since have had the benefit of these obvious and acknowledged truths. In other kinds of business, men *unite*, as in mercantile and manufacturing establishments, and, it is believed, to no inconsiderable advantage. And why should not A, B, and C, who are farmers, form a confederacy for agricultural operations—invest their capital in a common stock, and bring their concentrated powers to bear upon its skilful oversight and management? It seems to me that a combination of this sort, if judiciously got up, would present a spectacle to the community not only novel, but grand in its aspects, and pregnant with promises of extensive good in its bearings and results. If I mistake not, it would lead to conversation, and conversation would lead to thinking, and thinking would lead to *action*, which is precisely the thing we want. I might add, that in my opinion it would lead too to *wealth*, and this, with some perhaps, would be its most powerful, if not its only recommendation, in this speculating and "money making" age. The truth undoubtedly is, that there are simple ways of *making money*, (mean as the business may be, it is likely to be kept up) that have not yet been fully discovered, and tested, even in this "enlightened" day; and the cultivation of the soil on *scientific principles*, or, what is called in derision, "*book farming*," is one of those ways. You will misunderstand me, sir, if you infer from my remarks, that I am the advocate for monopolizing overgrown corporations, such, as it has been said, have been projected and proposed elsewhere, for conducting the *silk* and *beet culture*. The rebuke that has been given to these projects, by a distinguished agriculturist at the north, is doubtless a just, and I trust will prove an effectual one. I am for a union of a *private*, not a *public* character; for an association of *individuals*, without an array of *state* rights and *chartered* privileges. The advantages of such associations in conducting agricultural operations, I think, could easily be shown to be obvious and immense. Farming should be carried on as the business of *pin-making* is, which employs a multiplicity of hands to form that little *piercing* instrument, without which, beauty would lose half its charms. The services of persons, upon the enlarged scale contemplated, of the most approved qualifications, could be obtained *for*, and appointed *to* the *superintendence;* and at a far less expense than it would cost a single and inconsiderable member of the association, should he undertake the direction of his investment alone. The laborers employed could have their appropriate work, which they could pursue with almost, if not entire constancy, thus securing the advantages of adroitness in them, and preventing the evils that flow in farming affairs from perpetually changing from one kind of business to another, such as the accidents that result from awkwardness, or carelessness in raw hands, the loss of animal labor, and the use of costly implements, or sometimes the improvement of lands, and a neglect of timely attention to crops; which evils in a large and *systematized* or well regulated establishment might be avoided or corrected without difficulty or inconvenience. On this plan of arrangement, the establishment might have its ostlers, its millers, its gardeners, its fencers, its ploughmen, its ditchers, its hoers, and "last, though not least," its formers and distributors of composts and other *manures*, the "life and soul" of agriculture. I present you only with the rough and imperfect draft, a mere outline or sketch. Why will not some of our enterprising capitalists in Virginia fill it out, and with their improvements and additions give it a visible, tangible exhibition before the community? Such a copartnership would truly deserve the denomination of *par nobile fratrum.* In the language of your own pithy motto, they would, in my humble estimation, "deserve better of mankind, and do more essential service to their country, than the whole race of politicians put together:"—I add, than all the lawyers, doctors, grocers, and dealers in "wares and merchandise," in the whole republic.

For the present, I must pause, and, for aught I can tell, with your most cordial concurrence. If the above *scribbling* displeases you, be so good as to charge on yourself a share of the blame, as you have yourself been in part the *provoking* cause. If it will do to put *such things* in the Farmers' Register, you may possibly hear from me again. If not, I conclude with expressing for you, and your enterprise the best wishes of

TIMOTHY TANGENT.

P. S.—I mean no disrespect to the "learned" professions, nor even to the *merchants.* All these departments of business are useful, and there are men in them who are *honorable.* I merely say, that there are at present, more in them than are wanted, and would fain, if I could, persuade some of them to go out of their calling, and give their time and attention to the more *useful*, and I have no doubt they would soon find them, the more *pleasing and profitable* pursuits of agriculture.

T. T.

Since writing the above, your January number has come to hand, in which I am gratified to find, that some of the views which I have expressed are more fully exhibited and more ably sustained by your correspondent "Conservator" in his observations on "the different advantages of large and small farms considered," pages 565 and 566. Our principles, I think, are substantially the same. Perhaps he would object to the *form* of applying them, which I propose.

From the New York Courier & Enquirer of February 14.

MOB AND RIOT IN THE CITY OF NEW YORK. DESTRUCTION OF PROVISIONS, FOR THE PURPOSE OF LOWERING PRICES.

The Evening Post published, on Friday and Saturday, and the walls of the city have for some days past been covered with the following handbill:

"BREAD, MEAT, RENT, FUEL!

THEIR PRICES MUST COME DOWN!

The Voice of the People Shall be Heard, and Will Prevail!

☞ The People will meet in the PARK, *Rain or Shine*, at 4 o'clock, on MONDAY AFTERNOON ☜

To inquire into the cause of the present unexampled Distress, and to devise a suitable remedy. All Friends of Humanity, determined to resist Monopolists and Extortioners, are invited to attend.

MOSES JAQUES,
PAULLUS HEDL,
DAN'L. A. ROBERTSON,
WARDEN HAYWARD,
DAN'L. GORHAM,
JOHN WINDT,
ALEX'R. MING, Jun.
ELIJAH F. CRANE."

New York, Feb. 10, 1837.

As might be expected, language so well calculated to arouse the worst passions of the worst part of the populace of a large city, occasioned the assemblage in the Park yesterday afternoon of a great number of people, estimated at from 5000 to 6000 in number. A self constituted committee then made their appearance in front of the City Hall, among whom Alex. Ming, Jr. appeared most conspicuous. He made a speech, the chief topics of which, as far as could be heard, were the currency, banking, and finally high rents and high prices. Another orator followed, whose name we could not learn. Among other language he used the following: "Fellow-citizens, Eli Hart has now in his store fifty three thousand barrels of flour. Let us go down peaceably and ask him to let us have it at $ 10, if he don't we'll (after a long pause) go peaceably away." This speech was tremendously cheered, and several orators followed. In one of the intervals, Alexander Ming, Jr. offered a set of resolutions, of which we could only gather the sense of one, which was to the effect, that a memorial should be sent to the legislature to prohibit the issue of all notes under one hundred dollars. At the close of the speechifying, some of the most zealous in attendance, lifted Mr. Ming on their shoulders and carried him to Tammany Hall. The meeting consisted chiefly of foreigners, many of whom could not speak English. Certainly not one third were American citizens, and those chiefly apparently attracted there by curiosity.

Having left Mr. Ming at Tammany Hall, large numbers poured down Broadway, and after making one or two *detours* reached the store of Mr. Eli Hart in Washington street, near Vesey street.—This building has three large doors for the passage of goods to the warehouse, and a counting house with another door, adjoining. The mob had forced open the middle store door before our reporter reached the spot. On perceiving their proceedings, the clerks in the counting house closed the iron shutters of the windows. About twenty-five barrels of flour were then rolled out of the store, their heads knocked in, and the contents scattered about the street. At this time a number of the friends of Mr. Hart and a posse of police officers arrived on the spot, but they had encountered on their way in Dey street a part of the mob, who assailed them, and took away the officers' staffs, breaking them over their persons. The officers, notwithstanding, succeeded in clearing the store of the rioters, and appeared sufficiently strong to prevent the entrance of any more through the only door open.

The mob were thus kept at bay for about twenty minutes, during which time the mayor arrived and addressed them, remonstrating with them on the folly of their conduct. He was struck several times and pelted with flour and finally compelled to desist and retire. The rioters having received a large addition to their numbers, now seized the store door which had been torn off its hinges and with it battered down the remaining doors and forced open the window shutters, the persons inside, being only able to guard one door. A scene of havoc and confusion ensued. The people scattered themselves about the lower floor and counting house, and continued for one hour rolling out barrels of flour and carrying out bags of wheat—the contents of which were all turned into the street. The desks, papers, and every thing in the counting house were thrown out of the window, and the former broken to pieces by jumping on them. They then proceeded up stairs and began throwing barrels of flour out of the windows and down the hatchways. An half hour was consumed in this way. It was now dark and about 7 o'clock, when a strong body of police officers arrived, and in a few minutes dispersed the whole. Having procured lights, the police then searched the second story, but only found two rioters there, who jumped out of the window and were caught by the officers below.

The mob then crossed over to the East river, and commenced an attack on the store of A. B. Meech & Co. where they destroyed about twenty-five barrels of flour. They then marched off, carrying one of the ringleaders on their shoulders to the store of Messrs. Herricks, in Coenties slip; but here they were encountered by the police—to whose aid the citizens were turning out from all quarters—driven off, and dispersed.

Between thirty and forty persons were arrested and brought up in the course of the evening to the police office, by the officers and marshals. Among them were, James Chapman, who was fully identified as being one of the ringleaders, and a boy named James Roach, who, had been seen on the sill of the window of Mr. Hart's store crying out, "Here goes flour at $8 a barrel," throwing some in the street at the same time. They will all be brought up for examination to-morrow. Soon after 8 o'clock, a large number of the military, portions of the 27th regiment, were assembled in the Hall, and were marched down to the scene of action, and by nine o'clock, nothing of the mob remained.

The street in front of Mr. Hart's store was literally strewed with flour and wheat to the depth of one foot, and his loss will probably exceed $10,000. Swiss beggar women were seen in numbers running away with their aprons filled with flour, and the men in the neighborhood seemed almost all to have their coats covered with it.

Our remarks will be short on this disgraceful occurrence. It is not the actors in it—poor ignorant deluded wretches—that are to blame, so much as the instigators, who knowing better—knowing that the meeting could not answer the purposes for which it was ostensibly called—still devised it, solely to give themselves political consequence.

We are astonished that the civil authorities, with the call of this meeting before them, had not a sufficient police force, or the military, ready to prevent the consequences which it was probable would follow it. Twenty-five armed men could at any moment have dispersed the whole mob.

Though mobs of this kind may for a short time commit outrages, yet with the feeling we yesterday saw evinced by our citizens we are satisfied they will never be allowed to perpetrate them long. It was gratifying to observe the large number who spontaneously hastened to the scene of action armed, determined to put down quickly the disturbers of the public peace.

The foregoing statement furnishes evidence of an alarming degree of ripeness of the spirit of insurrection and plunder in New York—and of the very near approach of the war which is there to be carried on between the poor and the rich, for the possession of the property which the one class has earned, and which the other wants, and *will have*, by robbery, which is so much more easy than labor. We have anticipated such a consummation of the progress of demagogueism and agrarianism—but had not supposed that the operation of these causes had been so speedy and effectual, as now appears. It has not been many months since, when commenting on the acts of the abolition party, and their hypocritical expression of fears of the insurrection of slaves in the southern states, that we used in this journal these words: "From our slaves, *of themselves*, and from any political effects of slavery as it exists in the south, we have *nothing* to fear: *the throats and the purses of the property holders of New York are in much more danger from their mobs of free men, and the spreading of agrarianism.*" But though then conceiving the latter danger as manifestly impending, and approaching, we had no idea of its being so near, as now appears. It then seemed less likely that these excesses should so soon have been successfully excited and perpetrated, than *now*, that before ten years shall have passed, the great and rich city of New York will be given up to general pillage and conflagration, and afterwards to mob government, under the tyranny of Moses Jakes (a most appropriate name) then playing the part of a successful Jack Cade, a Marat, or the tailor-king of Munster.

It is true that some thirty or forty of the rioters and pillagers have since been arrested, and will be tried, and probably punished by the laws. But the worst offenders, the leaders and instigators, will go free, and will continue to pursue their course. Though (as is said above) twenty-five armed men might at any time have quelled this mob, it is not the less true that this great and populous city was for hours at the mercy of so weak a body of pillagers. This fact of the yielding to the daring of so few, is more alarming than if some temporary delusion had embodied and directed a mob of thousands. The greatest and most horrible excesses in Paris, during the French revolution—the massacres of thousands, continued unopposed for days together—were said to be the work of but a very few, compared to their victims, and that three or four hundred soldiers, properly directed, might at any time have defeated the mob of pillagers and murderers. But that *proper direction* was wanting in Paris, as the direction of the twenty-five men was recently in New York.

The established doctrines of political economy alone would have enabled the foretelling that the acts of this mob would serve to raise, instead of reducing, the prices of provisions: and such was the practical result. The panic probably did not long continue, and consequently neither did the increase of price thereby produced. But if the mob had succeeded, and low prices had been compelled, under pain of pillage, fire, and massacre—then the operation of such causes would have been fully seen. No more supplies of provisions would have been brought, until order and the authority of laws were restored, and until prices had again risen, free from restraint, to far above their former mark; and perhaps the change would not have been brought about, without the accompaniment and co-operation of famine.

Disorganized as is the City of New York, and is growing to be, her wealth and commercial prosperity rest upon a volcano, of which the threatening mutterings and heavings are already felt, and the eruption will not be long to follow. If her missionaries of abolitionism were allowed perfect freedom of access, and action on our negro slaves in the south, they would not find them such fit subjects for insurrection, as the agrarian instigators of pillage will find in the needy and turbulent populace of New York.]—Ed. Far. Reg.

From the Journal of Commerce.

THE MORALITY OF HIGH PRICES.

There have been many good people who thought it wrong to exact the market price, when that price was extremely high. Their consciences have been especially wounded when the dear article was a necessary of life. We have known good men who would never take any more for food, or fuel, or hay, when these articles were scarce, than when an ordinary supply existed. When men apply these remarks to themselves, no one will be likely to blame them for their scrupulousness. But when they lay blame upon their neighbors, it becomes necessary to inquire whether their opinions are founded in truth or error. Such persons have generally a notion that every article has in itself an intrinsic and absolute value, which is not susceptible of being changed by the greater or less quantity of it which may be in market. If there be any thing at all of truth in this idea, it is but little. Prices are not regulated by intrinsic value. What is intrinsic value? Let those who base their theory of morals on intrinsic value, examine that foundation, and if they can, give us its size and shape. The value of a pint of water might sometimes be the same as the life of a man; yet generally it has so little value that no price at all is fixed upon it, and not unfrequently it is a nuisance, and money is frequently paid to get rid of it. Yet according to the general notion of intrinsic value, a pint of water has as much of it in one case as in another. It will be distinctly seen, therefore, that intrinsic value, if there be any such thing, is not the measure of price. Those articles which have most of it, or which are most essential to our comfort and happiness, are by the goodness of the Creator made so plenty as to cost but little.

All persons admit the justice of some variations in price. But from *great* fluctuations they dissent. If an article is somewhat scarce, it may rise somewhat; but if extremely scarce, it must not rise by the same rule. All such reasoning is without an understanding of the value of price. It is the great regulator of consumption, always taking care that in time of plenty nothing should be lost, and that in time of scarcity a pittance should be on hand to the last day of need. The condition of the wretched crew and passengers on board the ship Diamond, which arrived from England the other day, is an illustration of the value of high prices. As their voyage was extended beyond the expected time, the provisions of the less provident, or less able, became exhausted, and they began to buy of those who had stores remaining. The voyage was extended to a hundred days, thrice the time which was at first anticipated. All this time prices were rising, until a potatoe was valued at a sovereign. The supplies on board the ship lasted to the end, and at the end not enough remained to sustain them another day. Of one hundred and eighty passengers, only seventeen died. If the price of the provisions on board had not been advanced above what it was when the ship sailed, they would probably have all been consumed, and every soul on board have perished.

Price is the regulator of consumption. If there is a scarcity, it draws supplies from a distance and deals out for consumption with a sparing hand. It is the Creator's prudential agent. Every effort to deprive it of its power of vibration, is an effort to counteract plans of the highest benevolence. The history of our own corn market during the present year, illustrates the usefulness, nay absolute necessity of high prices. If prices had not advanced, and largely too, there would not at this moment have been a barrel of flour in this market. If the price of flour had been kept down to six dollars, and of other articles in proportion, half the inhabitants of New York would have perished with starvation, or have been compelled to quit their homes and go where food could be had. Our supplies from the ordinary sources were not more than sufficient for half the year. If prices had not advanced, what would have brought relief? But high prices have penetrated into the interior of our own country, far beyond the circle of our ordinary supplies, and brought forth great quantities of provisions through our canals and rivers. The influence has extended even to Europe, and brought a fleet of ships laden with grain; and after all we have but a scanty supply. Shall we quarrel with high prices, when they have saved our lives?

This is a simple view of the matter, but it illustrates the use of prices, and shows how little of intelligent benevolence there is in all the complaints which are uttered against those who do business at market prices, whether they be high or low.

For the Farmers' Register.

ON THE EXPENSE OF TOBACCO CULTURE COMPARED TO THAT OF WHEAT AND CORN.

I think the celebrated John Taylor somewhere remarks, that the cultivation of tobacco is incompatible with any good system of agriculture. Although my experience in cultivating the crop more than doubles that of this truly eminent agriculturist, yet I am compelled to bring out the same verdict. I believe it may be fairly demonstrated, that in the present exhausted condition of the tobacco district in Virginia, there is little or no annual profit derived from its cultivation; and that the ultimate consequences of its culture are, the entire exhaustion of the *plantations* upon which it is grown, and the destruction of wood land to such a degree as to leave an insufficiency to fence them in. These truths are becoming so apparent, that some planters in this section of country have entirely abandoned its culture—men, too, of the finest practical sense, and who have been successful as tobacco planters for many years. The cultivation of other crops is so mixed up with the cultivation of the tobacco crop, that many planters are not aware of the true proportion of the labor of a farm that is bestowed on this crop. I have endeavored to make an estimate of the expense of cultivating and securing a thousand pounds of tobacco, and compared it with the cultivation of other crops suited to our climate and soil. In this estimate, no account is taken of the cost of teams or plantation utensils, my principal object being to contrast the expenses of tobacco cultivation with other crops: although I believe, on the score of teams, &c., the balance of expense is on the side of tobacco.

I have estimated the price of labor in every instance at thirty cents per day, and supposed the laborer found in provision.

Expense of tobacco culture.

Burning 100 square yards for plants, hoeing, covering and manuring—four days labor with one hand,	$1 20
Fallowing one acre—one day's labor,	30
To one other ploughing in the spring—one day's labor,	30
To making four thousand hills—six days' labor,	1 80
To drawing plants, cutting off hills, and planting four thousand hills—three days' labor,	90
To one other ploughing—one day's labor,	30
To weeding—two days' labor,	60
To first hilling—two days' labor,	60
To one other ploughing—one day's labor,	30
To second hilling—two days' labor,	60
To third do. do. do.	60
To worming and suckering—four days' labor,	1 20
To topping and priming—one day's labor,	30
To cutting 4000 plants, hanging on sticks and scaffolding—five days' labor,	1 50
To cutting and hauling wood to fire one barn of tobacco—two days' labor,	60
To firing the same—four days' labor,	1 20
To striking down and bulking five hundred sticks—two days' labor,	60
To stripping a thousand pounds of tobacco —ten days' labor,	3 00
To re-hanging the same—two days labor,	60
To re-striking, and packing in prizing order —two days labor,	60
To prizing 1000 pounds of tobacco—seven days' labor,	2 10
To carriage to market, distance of fifty miles,	7 60
To one tobacco cask,	2 00
To warehouse expenses,	50
To board and clothing of one laborer, sixty-four days,	6 40
	$35 60

Cr.

By the sale of seven hundred and fifty pounds of leaf tobacco, at six dollars per hundred,	$ 45 00
By the sale of two hundred and fifty pounds of lugs,	6 75
	$52 75
	35 60
Nett profit, if cost of teams were included,	$17 15

We will now make another calculation to show a similar result. It is the general estimate that a negro fellow that now hires for eighty dollars, will make fifteen hundred pounds of tobacco, and support himself by the grain made on the plantation. Suppose, then, the fifteen hundred pounds of tobacco is valued at eighty-five dollars, the hire and clothing of the negro fellow amount to ninety-two dollars. The carriage to market, cask, and warehouse expenses, deducted from eighty-five dollars, will leave seventy-five. So that the difference between ninety-two and seventy-five, which is seventeen dollars, is the loss in cultivating one hogshead of tobacco.

The difference in the result of the two statements above made, arises from the fact that the items of the days of labor were made as low as the greatest industry and exertion on the part of the laborer would justify. So that the last statement may be regarded as approximating nearer to the true profit of tobacco cultivation. Both of the estimates, however, conclusively show, that the cultivation of tobacco, at the present market price, is unprofitable. When we add to this the expense of wood consumed in firing, of timber in building barns, the meager return of manure from tobacco, and the great obstacle to improvement presented by a monopoly of nearly all the labor of a farm, it will convince a planter, of ordinary discernment, that as a system, it yields no profit, and is fast destroying the landed capital of the country. Tobacco culture is peopling the distant west, even faster than the demon avarice, who is toling on annually, thousands of pilgrims to worship at her shrine in a *promised* land of milk and honey, but who seldom live to sacrifice on her unhallowed altar.

The question now occurs, what can be cultivated as a substitute for tobacco: and if the above estimates are correct, a substitute that will yield a very small profit, is preferable. An acre of land that will produce a thousand pounds of tobacco, will produce twenty-five bushels of wheat in any ordinary year, since it requires land of uncommon fertility to produce a pound of tobacco from four plants. The expense of cultivating an acre of land in wheat, is as follows:

To one day's fallowing,	$0 30
To half of a day harrowing,	15
To cutting and shocking one acre of wheat —one day's labor for a hand,	30

To hauling to granary—a day's labor,	30
To thrashing or treading out 25 bushels of wheat—three days' labor,	90
To carriage of 25 bushels of wheat fifty miles,	6 00
	$7 95

Cr.

By sale of twenty-five bushels of wheat at one dollar per bushel,	25 00
Nett profit, if cost of teams were included,	$17 05

Thus it will be seen, that, notwithstanding the much greater amounts of labor bestowed upon the cultivation and securing the crop of an acre in tobacco, than that bestowed on an acre in wheat; yet the nett profit of each is about the same. The greater profit of the wheat crop will more manifestly appear, when it is recollected that a laborer can cultivate, perhaps, fifteen or twenty times as many acres in wheat as in tobacco. In the above estimate, the board of the laborer was inadvertently omitted, which would reduce the profit of the acre in wheat nearly a dollar.

An acre of land of sufficient fertility to produce a thousand pounds of tobacco, will yield ten barrels of corn, which, valued at three dollars per barrel, amounts to	$30 00
Fodder estimated at three dollars,	3 00
Shucks and tops at three dollars,	3 00
	$36 00

Expense of cultivation.

To one day's fallowing,	$00 30
To one day's ploughing for planting,	30
To one day's labor in planting,	30
To one day's ploughing at the time of weeding,	30
To one day's work in weeding,	30
To one day's work in hilling,	30
To one day's work in ploughing,	30
To one day's work in second hilling,	30
To two days' work in securing fodder,	60
To one day's work in securing tops,	30
To five cart loads of corn, pulled and hauled to crib, two days' labor,	60
To shucking out ten barrels of corn, and cribbing the same, two days' labor,	60
	$4 50
To board of laborer,	1 50
	$6 00
The estimated value of corn, fodder, &c. per acre,	$36 00
Expenses, &c.,	6 00
The nett profit,	$30 00

In the last estimate there is no charge for carriage to market. The corn is valued at the neighborhood price, and is generally delivered at the crib of the seller. I have long entertained the opinion, that if the farmers in the tobacco district had always a sure market for their corn at a convenient distance, it would be a much more profitable crop than either wheat or tobacco. But since a good manager can always raise one hundred pounds of pork with less than a barrel and half of corn, hog raising at four dollars and a half and five dollars per hundred, is a more lucrative business than tobacco at six dollars. Let, then, our planters greatly curtail, if not entirely dispense with, the tobacco crop; and raise wheat, corn, oats and hogs. Let them, in fine, like our calculating brethren of a colder clime, raise every thing that is adapted to our soil which yields some profit, and tends permanently to improve the soil. Tobacco has ceased to be a profitable crop in Virginia. It answers well as a pioneering crop to prepare a forest country for a farming one. But to cultivate large crops of tobacco on plantations impoverished by hard cultivation, is making the smallest imaginable annual profit, at an annual loss of capital of ten times the amount of gain. A tobacco plantation naturally deteriorates in value when tobacco is the prominent crop cultivated; a farm generally improves. When grain crops then can be made at equal annual profit with a tobacco crop, a farm is more profitable than a tobacco plantation. What, then, must be the folly of cultivating tobacco when the products in grain of the same plantation greatly exceed in annual value the tobacco crop? I have never believed that the tobacco crop is peculiarly an exhauster: like most large leaf plants, it draws most of its nourishment from the atmosphere: but its impoverishing effects arise from the fact that it monopolizes, during every portion of the year, most of the labor of the farm. It prevents, for the most part, attention to putrescent manures, without a regular application of which all farms, in the absence of mineral manures, must deteriorate. It should also be remarked that no part of the tobacco plant, except a meager portion of the stalk, returns to the land. The friend of humanity cannot desist from mentioning another objection to tobacco cultivation. I allude to the hard lot of those who are employed in cultivating it. When we take into consideration the attention that it requires, the night labor that is necessarily employed on it, and the uncommon physical exertion that many parts of its management call for, we must admit with Jefferson, that it is a scene of continual wretchedness.

E.

For the Farmer's Register.

THE WILD GOOSE.

Albemarle, 27*th Feb.* 1837.

No calling affords better opportunities for the study of natural history, than that of the farmer, except that of the naturalist himself—indeed the sometimes casual and hasty observations of the latter, lead him into errors which it is in the power of the former to correct: *exempli gratia*—Goldsmith makes the legs of the wild goose, saffron—those of the tame, brown; the reverse is true. But I beg pardon: it was not my purpose to take the field of controversy with the natnralist; but in the humble calling of a farmer, to found upon the consanguinity of the two professions, my right to fill a paragraph of the Register with the statement of a fact or two which I think will be new to most of its readers, to wit. A very worthy friend and neighbor of mine has succeeded in inducing a flock of wild geese to feed in his yard, and to receive corn thrown from his hand within a few feet. It is by the practice of that hospitality and kindness which he is known to extend towards all God's creatures, and of the most untiring patience, that he has accomplished a task scarcely less difficult than "taming the shrew." *This*, it is not probable, he will ever run the risk of encountering. He has allowed the geese for many winters to feed in his wheat fields and roost upon his fish pond, without molestation; not a gun has he fired at them, and no friend of his would fire one *within* his boundaries; and even *out* of them they are known, from their more gentle habits, as his flock. Last winter, however, he determined to try to *snare* one. Not with the same motives, I assure you, which actuate boys to catch hares; for his slip-knot was so contrived as not "to play with its gentle throat and tickle it to death," as the dog did with King George's rank mutton; but simply with the design to experiment upon the domitability of this *noble* bird, and if successful, to endeavor to raise a family of them to enliven a bachelor's homestead. He did succeed in capturing five in this way: but finding this rather a slow process, he has this winter, with the aid of the five tamed ones which were winged, decoyed five more into a rail pen with a net spread over it, in a corner of his yard. One of the first captives, my friend thinks, is the head of a family: the last five are the young brood brought to visit the gander, by the mother, who has been since caught by *unluckily* placing her foot within the circle of a noose whilst feeding at the door, Mr. ——— being prepared to give it a timely pull: this makes the stock eleven. They are becoming quite domiciliated, and often receive visits from their wilder brethren. I wish you could see these beautiful and intelligent birds marching up with measured step, their long and glossy necks arched, and heads erect to receive the accustomed bounty from their captor—the untamed, in the rear, looking around with suspicious eye, and occasionally uttering that mellow guttural note so well imitated by the deep tones of the clarionet: whether this is meant for a note of interrogation, or of satisfaction, or is the watchword of the party, I will not undertake to interpret.

It is a received opinion, that in all congregations of wild geese, when on their feet, one acts as sentinel; and on the wing, that a particular goose leads the flock. My friend, however, has observed, that in the former situation, there are many guards, and thinks they are the heads of tribes, and that each tribe recognizes no other leader. We may suppose that in their flight the same distinction prevails, priority of rank among the chiefs being accidental. This idea is countenanced by the frequent changes of post which take place in the line, and the different voices heard in musical accordance, which are the rallying calls of the chiefs to their lagging tribes. Thus it would seem, the patriarchal government prevails among them, though their gregarious and peaceful disposition leads the different tribes to seek each other's society. There is no doubt that the same flock returns annually to the same place, in its migratory journeys.

There is one fact connected with the subject of farming, which will give this little historical treatise a farther claim upon your notice, viz: Mr. ——— has perceived no injury to his wheat, at harvest time, from the depasturing of the geese, after they have spent the winter, and till the middle of March upon it, and generally confining themselves to a favorite part of the field. Farmers may make what they can of this information. Does it not sanction closer grazing with sheep? At all events it may serve in some measure to modulate the dissonant notes of the old song, which this moment salutes my ear, of "*tuckey* in the wheat patch." Adieu.

Your friend, H.

DIRECTIONS FOR THE CULTIVATION OF WATERMELONS AND CANTELOUPES IN LAT. 43°.

To the Editor of the Farmers' Register.

February 25th, 1837.

Enclosed I send you memoranda for the management of watermelons and canteloupes, by a gentleman who, in 43 degrees of north latitude, frequently raises melons weighing from thirty to forty pounds. If the same pains were taken in the south, how fine and large we might grow our melons. Your obt. serv't,

—— ——.

Holes, 2 feet diameter, 20 inches deep, filled 1 foot with garden rubbish and unrotted manures, beat down hard, and watered, (two or three buckets full,) then filled to the top with rich soil: on this spread an inch of fine compost or well rotted manure, compact, but not hard. Stick the seeds—(say twenty or thirty to a hill,)—the upper end of the seed to be a little below the surface of the compost; brush over the hill with the hand so as to fill the holes made by the fingers; then cover the hill with an inch of clear *sand*, often watered. In Alabama, I should think, grass turf, (the grass side down,) would be a good filling for the 12 inches.

Hills, 10 feet apart, 2, 3, and at most, 4 plants only to remain in a hill, and standing apart from each other: thinned by the time the plants have 6 leaves.

If the season be dry, dig down by the side of the hills nearly as deep as the bottom of the holes, and put in a bucket or two of water—filling the hole after the water is absorbed: as soon as the yellow bug is gone, take away the sand and supply its place with soil. This is all that can be done in the hill.

When the plant has six leaves, take off the centre shoot with the point of a sharp pen knife, and when the lateral shoots are six inches long, take off all but three: when these begin to fall to the ground, secure them down with cross sticks; and as they advance, spade up the ground a foot deep in advance of the vines.

Once in every 3 or 4 feet, put a shovel full of soil on a leaf joint of the vine, (not covering up the leaf,) and press it down gently with the foot on both sides of the leaf: if this is kept moist, it will take root. The ends of the vines to be kept to the ground by cross sticks.

Let the vines spread from the hills so as to cover the whole ground.

If the side branches of the main vines are inclined to head up, and not to keep to the ground, take them off, say a foot from the main vine.

All pruning to be done in the middle of the day when the sun shines.

Let no melon set within 4 or 5 feet from the root; and then only one on a lateral branch, three to a plant. Let the vine run on as far as it will—keeping it to the ground: permit no melon to grow that is deformed: pull off no male blossoms.

When the melon is nearly to its size, others may be permitted to set on the same vine, and a second crop raised. I should think the vines might be made to grow from 20 to 30 feet long.

Great care should be taken that the vines are not moved or trod upon.

The *early* but *small* melons.—Let the melon set at the 2nd or 3rd leaf-joint from the root, and take the vine off two joints beyond the melons.

To increase the number of canteloupes.—Take off all the melons that set within two feet of the roots.

These may be planted 6 feet apart, 4 to the hill, and require no particular attention.

Sand on the hills is one of the best preventives against the yellow bug, though not entirely a preventive.

It is useful to plant pumpkin or squash seeds near the hills for the bugs—taking care to pull them up as soon as the bugs are gone.

Canteloupes should not be planted nearer than 20 yards to musk melons or cucumbers.

To improve your seed, save none but from the very best melons.

Keep a record if you wish to know certainly the results.

THE DEFICIENCY OF PROPER AID TO THE FARMERS' REGISTER. PROFITS OF FARMING IN VIRGINIA. EMIGRATION.

To the Editor of the Farmers' Register.

February 24th, 1837.

No one more highly appreciates the zeal and ability which suggested, and which have hitherto sustained your Farmers' Register, than I do. But it is obvious from the very nature of the work, that the zeal and ability of no single individual, however talented, can keep alive the interest and utility of such a production. It purports to be, and was intended to be, a medium of intercommunication among farmers, by which all should get the benefit of the experience and skill of each; wherefore, if they refuse or neglect to communicate the results of their experience and observation, the whole object is frustrated—the Register, instead of being, indeed, a register of facts and experiments, necessarily becomes a sort of compilation of miscellanies, many of which are of no general practical utility. The last two or three numbers of the Register illustrate this. Though evincing high ability and great labor on the part of the editor, yet they evidently have, in a great degree, lost the character originally designed to be maintained in the work. For this you are in no sort or way to be blamed. The whole fault lies at the door of us, for whose benefit the work was undertaken—who have shamefully neglected to afford that aid without which it could not be sustained. Nor do I hold myself exempted from the general censure. Though I might in truth say I have little skill, of course little success in agriculture, worth communicating; yet if I had possessed the zeal which you display, I (no doubt,) might have done something towards exciting the farmers of the state to exertion.

The peculiar character of our southern population may account for this singular indifference on a subject of such obvious interest to all. Our northern brethren, when about to achieve any object, readily unite: among them there is little or no self-dependence—scarcely any individuality of character or action: should any design of philanthropy, (moral, physical or political,) be suggested, strait way a society is gotten up—individuals lose their identity in the mass, and they go at their object in earnest, (generally not over scrupulous about the means, so they attain their object—each throwing away personal responsibility, and sheltering himself behind the whole body.) Thus we see their canals, rail roads, temperance societies, missionary societies, caucuses, &c., &c., &c., all conducted by a master spirit or two, by the means and instrumentality of the rank and file who are used as engines for their purposes. Not so in the south. Here, there, is a marked individual character and conduct, a decided self-dependent spirit, that spurns dictation and direction; and is, therefore, exceedingly hard to be concentrated to a point by the action of any one or more persons. The last are most to be loved and esteemed for their honor and truth—the first, most to be admired for their successful industry and perseverance. Each man to the south, either thinks he knows best how to conduct himself, or his farm, or at least if he does not, he chooses to go on his "own hook," right or wrong. There (to the north) no one will venture to hold or express an opinion unless sustained by his *society* or *party*. I feel no desire, (myself) to change characters with our Yankee friends—but a little imitation of some of these qualities might not be unfriendly to our general improvement, especially in agriculture. We might unite, for instance, in furnishing matter to your journal without the sacrifice of those peculiar characteristics of our climate and population which I have named above. These observations afford no topics of consolation, when we view our wasted fields, our decayed edifices, our degenerated population, our rage for emigration and the general despondency of the "bone and sinew," the strength and virtue of our people. Something must be done for our agriculture, and for our mental and moral *improvement*, or Virginia must become once more a vast hunting ground for a savage race, filled with beasts of the forest. All the wisdom and virtue of the state should be concentrated to this object, or we, who are now left here, must follow on to a new country and a different region.

It is not true that this is no region for living in comfort, and even in affluence. No where can money be more advantageously invested where the object is comfort, and indeed abundance; but we have lost pride of character, and have substituted in its place an all-absorbing avarice, which will not be satisfied with any thing short of wealth. This, moral and mental cultivation would root out, if aided by that improvement in agricultural production which a little more skill and energy would certainly insure to us.

These observations have been drawn forth by an article in the last Register purporting to show the profits of a Virginia estate, to some of the details of which, you express your dissent. I am not prepared to say, *some* of them may not be exaggerated; but I do say, that the writer made out his account on just and proper principles—such as govern all the estimates made of the profits of any business whatever. My own experience and observation will supply a case going to corroborate his views. A gentleman, just about to settle in life, had $10,000; with this he purchased five hundred acres of land at $5 per acre; he bought eight negroes, for which he gave $6500, and with the balance, he purchased farm and house; from this farm he sold $800 worth of grain, &c., &c. It afforded him a house (rent free) $200; meats for his table $200; fuel and vegetables $200; a bed for a friend, at any time, with stable, food, &c. for his horse, comfortable dinners and abundant breakfasts, suppers, &c., all this with the income from $10,000; which at interest, would be but $600—a sum utterly inadequate to his decent support any where, much less to the genteel and comfortable support he draws from his farm. This is no extravagant case. I appeal to the experience of any man acquainted with middle Virginia to say, whether just such investments could not be made in very many places, with at least equal results.

It may be objected, that these results are inadequate, in as much as the owner is not sufficiently paid for his time and labor. I answer, that for the most part, the compensation for both is ample, in the ease and comfort of the life, let alone the pecuniary profit. Agriculture never was a business at which large fortunes were rapidly made, and I do not believe it ever will be. Though, at this time, cotton growers at the south are said to be making very large profits, or rather large gross products, I apprehend the necessary expenditures are likewise very large; and at all events, this must be temporary, as so profitable a business as theirs is, will not be long before it is filled up, and seeks the level of others, according to an immutable law of commerce. All I would urge is this—that our own Virginia, to the industrious, temperate, and prudent man, affords sufficient advantages to insure him peace and plenty for life, with a reasonable hope of leaving a family of well-brought-up children in the same condition, when he dies; and with this, every good man ought to be content. And surely these benefits, when acting in conjunction with that love of country which all ought to cherish, should keep more of our citizens in their native state.

I did not propose to lay down any plan for the management of a farm adapted to our peculiar situation. There are, however, many in our state whose success and intelligence will qualify them for such an undertaking; and I do hereby invite such to spare a little time from their domestic avocations, and afford to their unsettled fellow-citizens their experience, which alone will suffice to prove that health, comfort, abundance, and even wealth are yet to be attained in the old dominion, if we will but use the means. I could myself furnish a list of excellent farmers—men illustrating the character of which we have been wont so much to boast, who yet live to adorn their native state, and whose practice, if followed, would entirely supersede this imaginary necessity for emigration which is raging among us. But these men, restrained by their native modesty, or else yielding to the madness of the times, will not step forward to aid in arresting an evil which we all so sensibly feel; and will find out, perhaps, too late, that much of this evil could have been by themselves removed, had they contributed their exertions to those of our excellent Register.

I will not apologize for this longer rigmarole than I intended to inflict upon you, because if it contains a suggestion worthy of your journal, you can take that out and use it; if it does not, the reading will give you little trouble, and I will take care to pay the post.

I am yours,

H. B. M.

From the Farmer and Gardner.

TOBACCO PLANTERS' CONVENTION.

The convention of delegates from the tobacco planters of the states of Ohio, Virginia and Maryland, assembled at the City Hall in the city of Washington, pursuant to adjournment, on Tuesday, the 24th ult.

Governor Barbour, of Virginia, was called to preside over the meeting, and John Mercer, Esq. of Maryland, appointed secretary.

The president on taking the chair, addressed the convention, and in an appropriate and eloquent manner explained its objects.

After a few remarks by another gentleman, Mr. Dodge, the consul of the United States for the port of Bremen, who was present by invitation, gave to the convention some valuable information on the subject of the tobacco trade, with which his position and opportunities have made him thoroughly acquainted.

The Hon. Daniel Jenifer, chairman of the committee appointed for the purpose, made the following report:

The committee appointed by resolution of the convention of tobacco planters, held in this city on the 2d and 3d of the present month, to "ascertain the quantity of tobacco exported annually from the United States to foreign ports; the increase or decrease of the same from the year 1792 to the present time; also the amount of duties imposed in foreign ports; together with such other information as they might deem proper to communicate," have availed themselves of such information on the different subjects as they could obtain, which they now ask to submit to the consideration of the convention.

By a statement on file in the treasury department, which is a similar one to that presented to the convention at their last meeting, it appears that the quantity of tobacco annually exported from the United States to all foreign ports from the year 1790 to 1835, inclusive, has varied much less than might have been expected, and more especially when formerly the whole growth of this article was confined to the states of Virginia and Maryland, whereas, at the present time, in addition to those two states, considerable quantities are grown in Kentucky, Ohio and Tennessee, which, together with Pennsylvania, Connecticut, Indiana, and Missouri, united, are estimated to produce nearly, if not quite, as much more. Still the exports have seldom exceeded 90,000 hogsheads, and 3,900,000 pounds of manufactured; the whole of the surplus being consumed within the United States, keeping down the exports to nearly what they were in 1790.

During the three years immediately preceding the French revolution, the average annual exports from the United States were 111,030 hogsheads, and of manufactured 112,260 pounds.

From the year 1793 to 1800, inclusive, the average annual exports were 70,308 hogsheads, and of manufactured, about 200,000 pounds.

For the year 1801, the exports went up to 103,758 hogsheads, and of manufactured to about 2,000,000 pounds, but decreased the next year to 77,721 hogsheads, and continued at near that average until the years 1807 and 1808, when the Berlin and Milan decrees, and the embargo brought down the exports to less than 10,000 hogsheads.

From 1809 to 1812, inclusive, the annual average was, of exports, 66,659 hogsheads. The two succeeding years, being those of the late war with Great Britain, the exports were almost nominal, being less than 4900 hogsheads.

From 1815, the first year of peace, up to 1835, the exports (with the exception of the years 1827 and 1832) have averaged about 90,000 hogsheads, and 2,500,000 lbs. of manufactured tobacco.

The years 1827 and 1832, the exports exceeded those of all former years since 1792 to the present period. The amounts being for the first, 100,025 hogsheads and 2,637,411 lbs. and the latter 106,806 hogsheads, and 3,456,072 lbs. being the largest number of hogsheads exported from the United States since that year, which amounted to 112,428 hogsheads.

In 1835, the exports were 94,353 hogsheads and 3,817,858 lbs. which may be taken as a fair average of the past and present year.

Although the *number* of hogsheads exported in 1792 and the years immediately preceeding, were greater than for the last ten years, yet, when it is considered that the weight of the hogshead is considerably increased, as also the quantity of manufactured tobacco, it is believed that there is but little difference in the number of *pounds* exported between the former and present period.

Weight of Tobacco.

In 1790 and for some years subsequent, the average weight of a hogshead was about 1000 lbs. At the present time, those from Kentucky average about 1300 lbs.; and, although the finer qualities do not exceed, if equal, the former weights, yet, much the largest quantity exported being coarser and heavier, it is estimated that the average weight of all kinds, from Virginia, Maryland, Kentucky, Ohio and Tennessee, is about 1200 lbs. to the hogshead. This, in addition to the increased quantity of manufactured tobacco, will show but little difference in the amount of exports between the former and present period.

Prices.

There has been a considerable diminution in the prices of our tobacco from the year 1800 to the present time, with the exception of the four years immediately succeeding the late war with Great Britain; during which it sustained an average of about $13½ per hundred lbs. From 1800 to 1809, the average price for those ten years was $6 5-8 per hundred lbs. whilst, for the same number of years to 1835, inclusive, it has not been quite $5 1-8 per hundred lbs. notwithstanding the quantity exported has been increased.

Value of Exports.

Prior to the year 1802 the value of the exported tobacco has not been ascertained. But in that year it amounted to $6,220,000; in 1816, just after the war, to $12,809,000; and in 1835, to $8,250,577, of unmanufactured, and of manufactured $357,611, making an aggregate value of $9,608,188. Thus, the value of annual exports from the United States of this article alone, under all the disadvantages of onerous foreign imposts and restrictions, may be put down at near $9,000,000.

With these facts before them, the committee do not see that the depressed state of the tobacco market can be attributable to the increased quantity produced in, and exported from, the United States. They must, therefore, look to other causes for the present reduced price of that staple.

Prior to the American revolution, all Europe depended on us for supplies of tobacco; but the war cutting off this resource, their attention was turned to its cultivation, since which period it has been more or less grown over the whole continent; the quantity then, produced at the present time, your committee have no means at hand of ascertaining. It is however, not to be denied that such is the inferiority of its quality, that it does not come in competition with the tobacco exported from the United States; but, from the *duties* and *restrictions* imposed by foreign governments and their agents, upon the American produce, the peasantry are compelled to use it, to the exclusion of the latter, except to a limited extent.

The *duties* and *restrictions* in foreign markets on American tobacco are enormous, and in many ports in Europe amount to a total prohibition—more particularly in England, France, and the interior of Germany. If those duties and restrictions were so modified as to bear a fair proportion with numerous articles admitted into the United States from those countries, it is believed there would be much greater demand for American tobacco abroad, and the prices necessarily increased.

Although the duties paid in Amsterdam, Roterdam, Bremen, and other ports of Holland and of Germany, on the Atlantic, are nearly nominal, yet tobacco cannot be introduced into the *interior* of Germany, which consumes the greatest quantity, without paying a duty of 11 Prussian dollars upon the hundred weight of manufactured tobacco, which is about equal to $7 40 American, and upon unmanufactured, which generally goes in hogsheads, of 5½ Prussian dollars, equal to about $3 40 American, upon the hundred weight, which is one hundred per cent. upon the *hundred weight*, which is one hundred per cent. upon the average price of 100 pounds of tobacco shipped from the United States.

When it is considered that the consumption of American tobacco in Germany and Holland is estimated at 53,000 hogsheads annually, (40,000 of which are consumed in Germany alone,) which are more than one-half the whole *exports* from the United States, we cannot be wrong when we attribute the present depressed state of the tobacco market to the *duties and restrictions exacted abroad*.

The quantity of tobacco grown in France during the years 1818, 1819 and 1820, (the only years we have correct data for,) averaged about 24,000,000 pounds, which, allowing 1000 lbs. to the hogshead, would be 25,000 hogsheads. The present exports from the United States to that country do not exceed 7000 hogsheads, and their whole consumption may be estimated at 35,000 hogsheads, and there, as in Germany, the peasantry are compelled to use their inferior miserable stuff at an exorbitant price, mixed with a small portion of American product.

From a statement, made out with great care and labor by Joshua Dodge, Esq. American consul at Bremen, to whom we are indebted for much valuable information on the subject, it appears that the quantity of tobacco imported into that port from the United States, nearly all of which goes into the interior of Germany, from the year 1828 to 1835, has varied but little. Thus, it is apparent that the exports from the United States, and imports into foreign markets, have not increased so as to produce the present depression.

It is a remarkable fact, the cause of which we have been unable to account for, that the duties exacted in Holland and Belgium, on *Maryland* tobacco, are 14 per cent. higher than those paid on the same article from "Virginia, and all other North American states." The same difference applies to the *transit* duty through Holland and Belgium, and which is confined to *Maryland tobacco alone.*

The foregoing are the principle facts the committee have deemed proper to present to the consideration of the convention; and believing that the present state of things operates unequally and injuriously to the tobacco planting interests, which is not experienced by any other class of our citizens to the same extent; and looking at the annual value of the exports of tobacco from the United States, which at present exceeds $8,500,000, they confidently trust that some means will be adopted by the general government, which alone can remedy the evil, to secure and protect the tobacco interests of the United States abroad, in common with those of her other citizens. They therefore respectfully recommend the adoption of the following resolution.

Resolved, That a memorial be presented to the congress of the United States, signed by the president and secretary of this convention, in behalf of the tobaccco planters of the country; praying that such means may be adopted as may be best calculated to promote the tobacco interests of the United States, and relieve the planters from the oppression and onerous burdens imposed by foreign governments upon that article of commerce, particularly in those countries from whence their exports are admitted into the United States free of duty, or at a reduced rate.

DANIEL JENIFER, *Chairman.*

The above report having been read, was unanimously adopted.

On motion of Mr. Mercer, the proceedings of the convention were ordered to be published in the newspapers of the District of Columbia.

The meeting then adjourned, to re-assemble at any time when a call for that purpose shall be made by the president of this convention.

BEET SUGAR IN ENGLAND.

Many of the English farmers are beginning to turn their attention to the cultivation of the Silesian beet for the purpose of manufacturing it into sugar. The success which has attended the business in France, they consider a sufficient guaranty for its profitable cultivation in England, and they are engaging in it with a spirit and perseverance highly creditable to their national enterprise.

[*English paper.*

ITEMS OF HUSBANDRY FROM VARIOUS SOURCES.

To the Editor of the Farmers' Register.

Madison Co., Va., February 23rd, 1837.

Being confined to the house by a rainy day, I herewith send another communication. Following so shortly after a previous one, I fear it will be considered intrusive. But you can dispose of it as you think best.

Worn out lands.

To rely upon clover, plaster and rest alone, for the improvement of worn out lands, is fallacious in the extreme. Other aid they must have, or they will rather deteriorate, than improve. If land has sufficient life to produce a tolerable covering of clover, then it may be improved by clover and plaster, otherwise, no dependence is to be placed upon either, until brought to that state of fertility by the application of manure. Such land may be then continued in a progressive state of improvement, by clover and plaster, rest, and a proper rotation of crops. Worn out lands are more dependent for improvement, on a judicious and bountiful system of compost making and manuring, than on any other general plan for their resuscitation.

Ditching.

As a means of improvement, draining is the most important, the most permanent, and that which ought to precede every other.

Manure.

Manure should be spread as soon as it is hauled out; it sustains much less loss from evaporation when spread, than from fermentation when lying in heaps.

The amount of expense in manuring is unimportant, provided that the crops derived therefrom repay the expense with sufficient profit.

We should not apportion our manure to the quantity of land we may wish to place under tillage; but should apportion the land to the quantity of manure we can command.

No more ground should ever be brought under tillage than can be manured and cultivated well by the force at the command of the farmer. If a farmer finds that his land is becoming unproductive, and that he is unable to keep it up by manuring, he may be assured that he is cultivating too much, and his only remedy is to abridge his fields to the dimensions which he is able to manure, no matter how small they may be. If he has a force capable of cultivating a hundred acres in the old way, let him put the whole of that force upon twenty-five acres, and pursue a system of high culture. The first year he will probably not make so much as he would have done in the old way on the one hundred acres, but the second, and forever afterwards, he will make more, and this with less labor. As to a scarcity of manure, this is imaginary. Go to the woods, swamps and marshes—they are inexhaustible. If five hundred bushels of corn can be made on ten acres of well manured and cultivated land, it is clear that it will be more profitable than to make the same quantity on fifty acres, and that it can be done, is not a matter of doubt. The evil then, is not the inability to manure, nor the scarcity of manure, but the attempt to cultivate too much land, which is a violation of a principle in agriculture, on the strict observance of which, the prosperity of the farmer entirely depends.

Rye.

To preserve rye, and secure it from insects, rats and other disasters, nothing more is necessary than to let it remain in the chaff after thrashing. In this state it has been kept for years, perfectly sound.

Instrument for measuring land.

Let a pair of wooden compasses be made, and braced so as to represent the letter A—when standing upright, to be about breast high, and the feet to stride exactly six feet. With such an instrument, made so light as to be twirled round with ease, from foot to foot, and the strides counted as the measurer walks along, any square piece of ground may be measured, by thus striding off the two sides with the compasses, and multiplying the one side by the other, [in yards,] and then dividing by 4840, the number of square yards in an acre.

Oats.

If they are ever so stout, mow (not reap) them when beginning to turn yellow, dry them well, and thrash them as much as you please, and the cattle will prefer the straw to the best meadow hay; this prevents their shattering in harvesting besides, and the grain is not only heavier, but much brighter. If they are permitted to stand until quite ripe, the straw will be almost worthless. A sufficient quantity for seed should be suffered to come to full maturity before they are harvested.

In reading agricultural works I am in the habit of noting down whatever I may consider valuable, in a book, kept for that purpose. Having thrown together some of those items, I herewith transmit them.

INCOGNITO.

ERROR OF THE PREVALENT OPINION THAT THE BREEDON (MAGNESIAN) LIMESTONE IS INJURIOUS TO LAND, EXCEPT IN SMALL QUANTITIES.

[The lime spoken of below, has been referred to by almost every writer on lime, or on agriculture in general, from the time that Tennant first announced the supposed cause of its supposed injurious effects, (in 1800) to the present day. The neighboring farmers believed and maintained that more than twenty-five or thirty bushels to the acre of the Breedon lime was hurtful to land, while other lime was used without damage, even to the amount of four hundred bushels. Mr. Tennant analyzed several of the limestones which had this bad character, and found them to contain a large proportion of magnesia—and thence he jumped to the conclusion that magnesia was injurious to land. This, as a striking illustration of the value of chemical science to agriculture, has been continually quoted since, as good authority, both for the fact and the reasoning. Even Davy mentions this discovery of Tennant's opinion with much respect, both in his introductory lecture, and in that on the properties of lime as manure. Yet Davy's own facts, as stated in connexion, do not sustain this opinion of the injury produced by magnesia in lime. He says—

> "In making some inquiries concerning this subject, I found that there were cases in which this magnesian limestone was used with good effect. Amongst some specimens of limestone which Lord Somerville put into my hands, two, marked as peculiarly good, proved to be magnesian limestones. And lime made from the Breedon limestone is used in Leicestershire, where it is called hot lime; and I have been informed by farmers in the neighborhood of the quarry, that they employ it advantageously in small quantities, seldom more than twenty-five or thirty bushels to the acre. And that they find it may be used with good effect in larger quantities, upon rich land."—*Agr. Chem. Lect. vii.*

The writer of the following extract is evidently no chemist, but is a practical farmer, and apparently an intelligent one. His deductions may be (and some certainly are) worthless—but the fact itself, from which he draws them, seems certain, viz: that the Breedon lime may be safely and advantageously used in large quantities—the long established ignorant opinions of the country, and the scientific discovery of Mr. Tennant, to the contrary notwithstanding.

We do not mean, by these remarks, to convey the opinion that it is not improper, and often actually and greatly injurious to land, to apply quick lime in large quantities, whether it contain magnesia or not. But in the statement of Mr. Donaldson, there is presented a new fact of some importance—and we desire our readers to use it to strengthen the force of this general truth—that before we give credit to scientific explanations of, and deductions from supposed facts, we ought to be sure of the truth of the facts themselves.]

Extract from the British Farmers' Magazine, for January, 1837.

In speaking of the application of lime, in vol. i., he [the author of British Husbandry] says that the farmers in Leicestershire have found, that if they apply more than twenty-five or thirty bushels per acre of lime from the blue magnesian stone of Breedon rock in that county, the bad effects are visible on the after crops for several years. Farmers are sufficiently opinionated and prejudiced without adding to it; and it is surprising the society under whose patronage the volume is published, should lend their authority to propagate such a palpable falsehood. The writer of this article farmed for several years, in the immediate neighborhood of Breedon, on a soil of loamy clay, that had been severely scourged by a former tenant. The first year, two fields, of ten acres each, were fallowed for green crops, and lime from Breedon was brought forward in May, at the rate of two hundred bushels per acre. Two days after it came from the kiln, it was pulverized by the application of water, and next day laid on the land, in that hot, caustic state, and immediately harrowed in. The land was then dunged, and drilled with potatoes, beet, and turnips. The soil having been completely robbed of decomposable vegetable matter by successive cropping, the principle was here acted on of supplying vegetable matter to the soil in shape of dung, at the same time with the lime, and of bringing the two into immediate contact; and also of reducing the soil very fine, so as to mix intimately with the lime, as clods are so much land lost, and the roots of plants cannot penetrate them in search of food. The crops were good; and next year one field yielded seven quarters and one bushel per acre of barley, and the other five quarters of wheat. The succeeding crops of hay were very heavy, and the lattermath cut heavier than the first crop. In the midst of one field, two ridges had a double allowance, viz: four hundred bushels per acre; and during the summer these ridges were distinguishable at a distance, being so very luxuriant and superior to the rest of the field, both under wheat and grass. Science and theory may point the way, but experience alone can establish facts. And here are facts beyond contradiction. The farmers in the vicinity foretold absolute sterility from such a dose, never having seen so much applied; and that on the headland, where the lime heap lay, nothing would grow for several years, except couch and thistles, which they had found that lime invariably produces. On that very headland there grew the largest beet shown at Smithfield show; and the whole field of six acres was the heaviest and most luxuriant crop ever seen in that country. How pure lime, or calx, which contains in itself none of the elements of vegetation, could produce couch and thistles, certainly requires a very considerable degree of that intuitive knowledge for which farmers are so much distinguished, to discern; no doubt, lime, by its decomposing powers, may afford food for weeds as well as for fruits; but then it is the business of the farmer to see that there are few or no weeds in his fields to draw the nourishment produced by his manures for the maturation of his crops. But of such force are the habits of our forefathers, that the farmers in the vicinity of Breedon fetch lime from a distance of six miles, and would not use Breedon lime if presented to them. Four ounces of each limestone, powdered, were dissolved in muriatic acid, filtered, and the filter paper and alloy of each being carefully dried and weighed, the difference was scarcely perceptible; if any, Breedon stone left least refuse. The writer had not leisure to make a more correct examination. But a sagacious farmer in the neighborhood, (for wise farmers much abounded there,) without any chemical test or knowledge of chemistry, discovered a quality in Breedon stone, which might otherwise have baffled our chemists for ages. Having one year engaged a dairy maid incapable of managing his cheese dairy, his produce of that year was spoiled by bursting; and having the year before laid on his pasture a mixture of lime and soil, he immediately concluded the lime had spoiled his cheese; and thus added another bad quality to Breedon lime. The fault lies, not in the quality of the lime, but in the method of applying it. The present system of farming must be improved, so as to keep pace with the other improvements of the dairy; the proprietors must themselves put their shoulder to the wheel, with the farmers following; and landlords should look out for professional persons to place in management of their estates, and send their stewards, lawyers, bankers, or half-pay officers, somewhere to learn.

JOHN DONALDSON.

From the Farmer and Gardener.

HENS LAYING IN WINTER.

Why cannot *hens* be made as profitable in the winter as the summer? It is a well known fact that from December till March, they are a bill of expense, without any profit. I wish to give your readers my opinion as to the *cause* of this refusal on the part of hens to contribute to their own support in hopes that some one may be benefited, which is certainly all I ask or expect for my labor in this case.

Hens, in order to supply eggs, require as a condition that they be supplied with a portion of *animal* food, as well as vegetable. This supply they get in the form of worms and insects, when free to go at large, unless their number is so large as to consume beyond the supply, within roving distance, which is the case where large flocks are kept; and it will be found that the number of eggs in proportion will be diminished, as the number of fowls are increased, unless a supply of animal food is furnished. Here is a secret worth improving, and if some of your readers who live near a slaughter-house will collect the offal meat, and feed hens with it, they will find it a good business, so long as eggs bring the prices now demanded for them. When fowls are kept yarded, they require lime, or burnt bones, gravel, meat, corn or grain, and pure water. Supply them with these—give good shelter, and a *warm* room in winter, and you may safely calculate on a clear profit of one dollar on each hen, every year.

From the Farmer and Gardener.

OBSERVATIONS RELATING TO THE PLANTING, MANAGEMENT AND CULTURE OF FRUIT TREES AND PLANTS.

Having been frequently applied to by persons about to procure trees and plants from the nursery, for instruction how to plant and manage them, and this happening often at a time when the pursuit of business renders it very inconvenient to give the information required; and as the success of planting trees depends much upon the treatment they receive after they leave the nursery till they have passed over the first summer, I offer the following observations for the use of those who are about to plant and have not had as much experience as myself.

Season of planting.—The delight peculiarly attached to spring, in the conduct and management of our rural concerns, may be supposed naturally to have a strong influence in governing the mind of many, in making choice of the vernal season, it having become the season the most generally adopted for engaging in this interesting branch of improvement; while it is sufficiently evident that the weight of experience will be found in favor of planting in the fall, especially in those parts of the country subject to severe droughts; as trees planted in autumn are less liable to suffer from this cause than if planted in the spring.

When we consider how very short our spring is, we ought to plant our large shrubs in the fall and open weather in winter; for the necessary vegetable and flower garden, transplanting flowers, herbs and other small articles that would be in danger of being thrown out of ground, if transplanted in the fall, by frost, will be as much as most people will be able to accomplish during our short springs. On this subject there is much truth in an assertion of that shrewd scientific writer, Wm. Cobbett, where I think he says in some of his writings, "a person in America would hardly think of there being any spring, the winter being so soon succeeded by summer heat." Our autumns are mild and so pleasant as to be the admiration of most European visiters, affording the opportunity from the 15th of October to hard frost, which seldom interrupts transplanting in this latitude before the fifteenth of December. But if other business should interrupt fall planting, large trees and shrubs may very safely be planted in the spring, from 1st of March (sometimes earlier) to the fifteenth of April, and many small matters, and all the evergreen plants, much later in the spring, it being much the best season to plant those last.

Arrival of the trees at the place of their destination.—Immediately on the receipt of the trees from the nursery, have the bundles carefully opened, and have a trench dug deep enough to receive the roots below the surface in a compact manner, with the bodies of the trees in a slanting position, then fill in some fine mould on and among the roots of the trees, and water them both roots and mould, till all is very moist, and cover all up till preparation is made for planting, which ought to be done before the trees arrive. Another excellent way to preserve trees is to plunge the bundles of trees, especially the roots, into water, where they will keep safely for a long time.

Method of Planting.—The holes for planting should be dug at least two and a half feet diameter, and about two spits or eighteen inches deep, casting round the lower spadeful, and using only the top one for planting the trees, which, if insufficient, use the surrounding top soil, or other, equally good or better, brought from elsewhere for the purpose. Mixing any sort of manure when planting, is considered injurious, but may be usefully applied around the trees as a top dressing. Before planting, trim off the bruised parts of roots, and trim off the tops of trees freely, leaving them as light as possible, preserving merely the form of a head; shortening the branches, especially the leading shoot, is considered injurious.

Before the trees are set in the holes, shovel in some good mould, in order that the tree may not be planted more than two inches deeper than they stood in the nursery, and spread the roots of the trees equally around on the said mould. In filling up the hole, care should be taken to make the earth fine, in order that it may run in among the roots of the tree, which may be promoted by gently shaking the tree as it is thrown in—water the roots well, then fill the hole up level with the surrounding ground; drive in a strong stake on the north-west side, and fasten the tree to it by a band of damp straw, passing it several times between and around the tree and stake, so as to keep it steady and prevent the wind form chafing it; in dry weather, during the first summer, the trees ought to be watered occasionally; once a week will be sufficient if done plentifully, so as effectually to wet the whole space occupied by the roots; some half rotten litter spread round the tree during the summer, would be useful in preventing the rays of the sun and the wind from dissipating the moisture—but it should be removed in the fall, as it might be a harbor for mice during the winter, who would be apt to injure the trees by feeding on the bark and roots.

ROBT. SINCLAIR.

From the New York Farmer.

NEW-ENGLAND AGRICULTURE.

I propose to sketch some very general views of the agriculture of the northern and western parts of the country, which I have had recently the gratification of visiting. With much of New-England, I have been long acquainted; and this season has afforded me the opportunity of seeing some of the western parts of New York, the north-western and central parts of Pennsylvania, and parts of Michigan and Ohio, not under all the advantages, which I could have desired; but with as many as usually fall to the lot of travellers in their transit over the country, by the usual public conveyances.

There is a strong impression prevailing, and not without plausible reasons, that the agriculture of New-England is on the decline; I do not mean in respect to the character, but the extent of the cultivation. Much less land in proportion to the population is under cultivation than was under cultivation twenty years ago; though in respect to the modes of cultivation, and the utensils employed, especially the plough, great improvements have been made. The amount of crops, from the same extent of land, has been greatly increased, and they are more carefully husbanded than formerly. Yet it is a discreditable fact, that New-England is dependent upon other parts of the country for the common necessaries of life; and has little to export, excepting perhaps a small amount of beef; and the amount of this article, which New-England exports, does not exceed that which is brought here alive from other parts of the country.

Maine, with an admirable wheat soil in many parts, grows comparatively little; and wheat flour with the Rochester, N. Y. brand upon it, is to be found far in the interior, a hundred miles, it may be, from the sea coast. Little Indian corn is produced, and small quantities of rye. Oats are raised in considerable amount; but not more than is demanded for home consumption. Excellent potatoes are produced; and of these, as well as of hay, some are sent to the capital of New-England, and there is an occasional shipment to the southern cities. A good many cattle are driven from Maine to Brighton and likewise into the British provinces; and, as grass-fed cattle, they are of a good description; but agriculture in Maine, though the state, notwithstanding its climate, possesses in this respect, great advantages, cannot be set down as a primary interest of the state. The fisheries, and especially the lumber business, are the great objects of pursuit.

New-Hampshire is even in this matter, behind

Maine, and this from the natural condition of the soil. To a stranger, unacquainted with the hardihood and spirit of the people, it is matter of difficult solution how the inhabitants of this state are sustained. There are it is true, some sunny spots. Some extremely well managed and beautiful farms are to be met with in Greenland near Portsmouth. There is some good cultivation near Exeter and in Salisbury on the Merrimack. There is excellent, I may justly call it pattern farming among the Shakers at Canterbury and Endfield, where all that persevering industry and untiring labor, applied with skill and judgment can accomplish, seems to have been done. There is excellent farming in that part of New-Hampshire, which lies upon Connecticut river; at Walpole, Charlestown, Claremont, Lebanon, Haverhill, and Lancaster. But a considerable portion of this state is doomed to perpetual unfruitfulness; is covered with mountains of granite, which defy all cultivation, and subject to late vegetation in the spring and early autumnal frosts, discouraging to the enterprise, and often fatal to the labors of the husbandman. Indian corn is in most parts of the state a precarious crop. Wheat, in those parts of the state where it is at all cultivated, has for three or four years, been much cut off by the grain worm. Rye is in no part of New-England a large crop; and this too, has suffered severely from the same pest. Some small amount of cattle are raised, but the severity and length of the winters make this an expensive process. On some of the Connecticut river lands the crops of oats have been abundant, in some instances rising to ninety bushels to the acre; but nothing like this is to be generally calculated upon, and hardly an approach to the necessary supply of bread stuff is at any time produced in the state. There are some valuable intervale lands near the head waters of the Saco, which present favorable examples of good cultivation; but they are quite limited. Considerable portions of the state are well adapted to the growth of wool; and at present New-Hampshire may boast of some as well managed flocks, and the production of some as fine wool, as any part of the world can furnish.

Vermont is, undoubtedly, the best, as it is the most exclusively agricultural state in New-England. The Indian corn crop in Vermont, is however, a very precarious crop on account of the climate; and it produces at present, comparatively little wheat. Wheat was farmerly cultivated in Vermont with much success, but for various reasons the cultivation for a few years past has fallen off. Wool is now the great object of attention, and the sheep husbandry is pursued with eminent skill and advantage. Vermont likewise may boast of some of the finest dairies in the country; and a large amount of butter and cheese are sent out of the state. The town of Barnet, on the banks of the Connecticut, has been long and deservedly celebrated for its careful cultivation and excellent dairy produce. The agriculture of the towns on the western side of the mountains, and on the lake shore, is very superior.

The agriculture of Massachusetts, is, with few exceptions, in a comparatively humble state. Of bread stuff, it produces but a small part of its necessary supply. Of wheat, a very small amount is raised. Of rye, much more than of wheat, but the amount is not large. Indian corn is more largely cultivated, but the farmers who produce more than five hundred bushels per year, are a small number. Barley is cultivated to some extent in some parts of the state; in others the cultivation has been abandoned on account of the grain worm, believed to be the same by which the wheat has been cut off, but this fact is not as yet ascertained. Oats are a small crop, and great quantities of horse feed, oats, corn, and hay, are imported into the seaports and their vicinity. A considerable amount of broom corn is raised; and the brush is manufactured and sent into different parts of the union; and the hops grown in this state, Vermont, and New-Hampshire, form in some years a notable article for exportation. Considerable beef is fattened in Massachusetts; and Worcester and Berkshire counties especially, are extensively engaged in the business of dairying. A large amount of wool, and some of the finest qualities are grown in this state. The culture of the mulberry and the feeding of silkworms are begining to be objects of attention. Some hemp and tobacco are raised, but the cultivation is quite limited. Massachusetts however, though highly spirited, enterprising, and liberal in her agricultural improvements, by means of well managed societies, liberal donations from the state, and the disinterested efforts of many eminent individuals, has comparatively little agricultural wealth; the farms are generally small, and in many cases cultivated as an appendage to a trade, profession, or some commercial pursuit.

Rhode Island is essentially a manufacturing and commercial community. With the exception of a few favored spots, the soil is steril and hard of cultivation. The island itself, from which the state derives its name, is singularly beautiful in its position and aspect, in most cases of a strong and productive soil, and having singular advantages for obtaining manure, on account of its proximity to the sea. Much sea grass, rock weed, and kelp, are obtained, and in some places fish, the munhaden, which are taken in great abundance, are freely and successfully used. With the exception, however, of the product of potatoes, and especially of onions, which it grows to a large extent, the state has no agricultural produce to export; and is almost wholly dependent on other places for its supply of bread.

Connecticut likewise is a manufacturing state; and agriculture scarcely exists as an exclusive profession. Some parts of Connecticut have been long remarked for the extensive cultivation of onions, and a considerable amount of wool and tobacco is raised in the state, but its agricultural products are by no means equal to its wants. Connecticut has some large, and is full of small manufacturing establishments; and no part of the United States has a greater appearance of neatness, comfort, and good economy. Its manufactured articles are found in all parts of the union.

It is sometimes asked how, with a soil and climate not very propitious, the Yankees live, and live in comfort; and if they do not acquire large and overgrown fortunes, yet present more than a fair proportion of examples of humble competence, and as much independence as usually falls to the human condition? The answer may be comprehended in three words, industry, enterprise, and frugality. Climate and soil may be against them, but the condition in which Providence has thrown them, contributes to nourish a spirit of self-dependence, and to form a hardihood of character, which is the foundation of their success. Their enterprise carries them into all parts of the country, and the world; and if the usual traits of the Yankee character go with them, their enterprise seldom disappoints their calculations.

I trust it was not mere prejudice—for of that I should feel quite ashamed—that in travelling through the new parts of the country, I persuaded myself that I could, in most cases, point out a Yankee settlement or homestead, without inquiry. In several instances, where I attempted the experiment, the inquiry confirmed my conjectures. There was a certain air of carefulness about the house and out-buildings, which distinguished them from most others. I am far from thinking their ways are always best; and as it respects agriculture, they are far behind the Pennsylvania farmers; but in the capacity "of getting along" on small means, and with honor, comfort, and independence, no people surpass them.

The Yankee too has an officiousness in other men's matters, which if it has its evils, as it is sometimes complained of, it is not without its advantages. He no sooner plants himself in any situation, than he has a "notion" that the community would be better for good roads, secure bridges, a school house, an academy, and a meeting house; and these matters, in general standing in pretty close connection, usually, though silently, announce who presides over the municipality. The Yankees have a propensity too to have their houses painted, their yards neatly secured, their gates on the hinges and shut, and the pigs kept out of the hall and the front parlor.

This appearance of neatness, care, frugality, and thrift, indicates generally the residence of a Yankee settler; and leads us back to the circumstances under which such a character is usually formed.

With a hard and unpropitious soil, a severe climate, and a population which if confined to its own resources, would press sorely upon its means of subsistence, he is compelled to labor and exertion, that he may live; obliged to gather up the fragments that remain, so that nothing shall be lost, he is trained in habits of extreme frugality; and his invention is continually toned and stimulated by the great spur of necessity, and a spirit of enterprise aroused and cherished, that he may increase his resources. When the Yankee emigrant carries these habits with him to his new place of residence among the fertile lands of the west, success and wealth are certain; but it too often happens, that when he finds himself in a situation where such constant and strenuous exertions are not required, and he discovers that even moderate exertion is most amply rewarded, far beyond his experience and even his imagination, the love of ease, almost an essential element in the human constitution, prevails over his early habits of industry; abundance begets extravagance and waste; he sinks into the negligent habits of those around him; and stops short in the very midst of improvement.

H. C.

January, 1837.

A BROOM CORN MANIA

Is getting up in this region, and the coming spring, from appearances, little else will be seen in the meadows. Broom brush is unexampled in price, selling readily at 15 cents; and ashes to put on broom corn land, sell at twenty-five cents per bushel in this village. The produce of an acre of broom corn was sold the other day in this town for $130 !—*Northampton Courier.*

THE TRUE AND THE FALSE DOCTRINES RESPECTING HIGH PRICES OF PROVISIONS.

[We first read the excellent work from which the following chapter is taken, near twenty years ago—and then admired this portion for its clear, yet extended views—its sound common sense, and practical wisdom. Concise as it is, for so copious a subject, it serves admirably to expose the ignorance (in this respect) of the learned, and of governments, as well as of mobs. But much as we then approved the opinions presented, and wished for their dissemination through the more benighted portions of the earth, we had no idea that such lessons would become necessary in this more happy and free country. But the recent movements of a mob in New York, (as stated at length in the previous pages of this number,) together with the very general and always existing, but heretofore harmless belief in the wickedness of receiving high prices for provisions, seem to indicate that these truths, though half a century old, may be no less useful than new in this country.

Views accordant with these, (as are all views that are derived from the same sound principles of political economy,) are presented in a previous article in this number, (at p. 742,) on the "*Morality of high prices.*" There are not yet many persons in the United States, who would consent absolutely to hang speculators in grain, or to rob them of their stocks, or burn their warehouses, barns or mills: but a very large portion of the community admit the truth of the theoretical principle out of which, all such outrages spring. This theory is, that *it is wrong and wicked to demand, or receive, very high prices for bread, meat, or grain.* The seller at high prices is deemed a vile offender—and the only question to decide, is what measure of punishment does his offence demand. The more virtuous and intelligent part of those who condemn, will merely express their opinion of the guiltiness: but the *brutish* mob, acting upon the same opinion, and when sufficiently excited by hunger and love of pillage, will first rob, and then murder the speculators; and thence the transition will be easy to all other persons guilty of possessing wealth.

If the whole community could possibly be governed and directed, through a single year of scarcity, by this prevalent opinion and mawkish sensibility, which are strengthened in effect by the most contagious of all kinds of charity—that which is exercised at other peoples' cost—if, in accordance with this doctrine, grain could be sold at half the price that it would otherwise have commanded, the effects would be, first, great waste of provisions, and next, famine. Speculators in bread stuffs (or monopolizers, if that name is preferred,) individually, are neither better nor worse than other persons: but their operations, (no matter what their motives and objects may be,) are more efficient than any other cause, to mitigate the evils of scarcity, and to prevent famine—and on the general average, even to reduce the prices of the provisions which they "monopolize" with the design of obtaining for them the highest possible prices.]—Ed. Far. Reg.

Extract from Arthur Young's Travels in France, during 1787, '88, '89.

Of all subjects, there is none comparable to the police of corn, for displaying the folly to whict men can arrive, who do not betray a want of common sense in reasoning on other topics. One tels us (I confine myself chiefly to French authorities, engaged as I am at present in researches in tlat kingdom,) that the price is in exact proportionto the quantity of corn, and to the quantity of morey at the same time in the kingdom; * and that wlen wheat sells at 36 liv. the septier, it is a proof there is not half enough to last till harvest. † He roposes to have magazines in every market, an to prohibit, under severe penalties, a higher rice than 24 liv. This would be the infallible meiod to have it very soon at 50, and perhaps at 10 liv. That the price of corn does not depend or the quantity of money, is proved by the sudden rise proceeding from alarms, of which this athor might have known an instance in the yer he printed; for Mons. Necker's memoir to th National Assembly was no sooner dispersed than the price rose in one week 30 per cent.; it the quantity in the kingdom, both of money ar corn, remained just as before that memoir was rblished. But it has already been sufficiently roved, that a very small deficiency of the crop w make an enormous difference in the price. I ny add, that the mere apprehension of a deiency, whether ill or well founded, will have e same effect. From this circumstance, I draw conclusion of no trifling import to all governmds; and that is, never to express publicly any prehension of a want of corn; and the only nhod by which governments can express their frs, is by proclamations against export; prohibitic; *ordonnances* of regulation of sale; *arrets*, or la against monopolizers; or vain and frivolous hsts, like those of Mons. Necker, of making grt imports from abroad. All these measures ha the same tendency; they confirm amongst the pele the apprehension of want; for when it is fou, amongst the lowest orders, that government alarmed as well as they themselves, their own fe augment; they rise in a rage against monopolrs, or speculators, as they ought rather to be ced, and then every step they take has the never-fng effect of increasing the evil; the price rises l higher, as it must do inevitably, when such ous obstructions are thrown on the interior te in corn, as to make it a matter of great and seus danger to have any thing to do with it. In h a situation of madness and folly in the peopthe plenty of one district cannot supply the et of another, without such a monstrous prem, as shall not only pay the expence of transpbut insure the corn, when lodged in granarieAainst the blind and violent suspicions of the pele To raise this spirit, nothing more is necess than for government to issue any decree wh ver that discovers an alarm; the people are ireditely apprehensive of famine; and this canver ake place without creating it in a great measure. It is therefore the duty of a wise and enlightened government, if at any time they should fear a short provision of corn, to take the most private and cautious measures possible, either to prevent export, or to encourage import, and to avoid making any public decree or declaration. The history of corn, in France, during the year 1789, was a most extraordinary proof of the justness of these principles. Wherever I passed, and it was through many provinces, I made inquiries into the causes of the scarcity; and was every where assured, that the dearness was the most extraordinary circumstance in the world; for, though the crop had not been great, yet it was about an average one; and consequently, that the deficiency must certainly have been occasioned by exportation. I demanded, if they were sure that an exportation had taken place?—They replied, no; but that it might have been done privately; this answer sufficiently showed, that these exports were purely ideal. The dearness, however, prevailed to such a degree, in May and June particularly (not without being fomented by men who sought to blow the discontents of the people into absolute outrage,) that Mons. Necker thought it right not only to order immense cargoes of wheat, and every other sort of corn, to be bought all over Europe, but likewise, in June, to announce to the public, with great parade, the steps that he had taken, in a paper called *Memoire instructif,* in which he stated, that he had bought, and ordered to be bought, 1,404,463 *quintaux* of different sorts of grain, of which more than 800,000 were arrived. I was a personal witness, in many markets, of the effect of this publication; instead of sinking the price, it raised it directly, and enormously. Upon one market-day, at Nangis, from 38 liv. to 43 liv. the *septier* of 240 lb; and upon the following one to 49 liv. which was July 1st; and on the next day, at Columiers, it was taxed by the police at 4 liv. 5s. and 4 liv. 6s. the 25 lb.; but as the farmers would not bring it to market at that price, they sold it at their farms at 5½ liv. and even 6 liv. or 57 liv. the *septier.* At Nangis it advanced, in 14 days, 11 liv. a *septier;* and at Columiers a great deal more. Now, it is to be observed, that these markets are in the vicinity of the capital, for which Mons. Necker's great foreign provision was chiefly designed; and consequently, if his measures would have any where a good effect, it might have been expected here; but since the contrary happened, and the price, in two markets, was raised 25 per cent. we may reasonably conclude, that it did good no where; yet, as appeared to the *Comptes Rendus*, this fine measure cost 40 millions of livres. But to what was this apparent scarcity imputable? Absolutely to Mons. Necker's having said, in his memoir, "*á mon arivée dans le ministere je me hátai de prendre des informations sur le produit de la récolte et sur les besoins des pays étrangers.*"* [Upon entering the ministry, I hastened to procure information of the amount of the crops, and of the demand of foreign countries.] It was from these unseasonable inquiries, in September 1788, that all the mischief was derived. They pervaded the whole kingdom, and spread an universal alarm; the price in consequence arose; and when once it arises in France, mischief immediately follows, because the populace render the internal trade insecure and dangerous. The business of the minister was done in a moment; his consummate vanity, which, from having been confined to his character as an author, now became the scourge of the kingdom, prohibited the export for no other reason, than because the archbishop of Sens had the year before allowed it, in contradiction to that mass of errors and prejudices which Mons. Necker's book upon the corn trade had disseminated. It is curious to see him, in his *Memoire instructif*, asserting, that France, in 1787, *etoit livrée au commerce des grains dans tout le royaume, avec plus d'activité, que jamais et l'on avoit envoyé dans l'étranger une quantité considerable de grains*. [The corn trade was more active than ever, and that there had been exported a considerable quantity of grain.] Now, to see the invidious manner in which this is put, let us turn to the register of the *Bureau General de la balance du Commerce*, where we shall find the following statement of the corn-trade for 1787:

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* *Consid. sur la Cherté des*ains, *par M. Vaudrey.* 1789. 8vo. p. 5.

† Ib. p. 7, 8, 19.

* He has introduced a tissue of the same stuff in his *Memoir sur L'Administration de Mons. Necker par lui même*, p. 367, where he says, with the true ignorance of the prohibitory system, "Mon systême sur l'exportation des grains est infinment simple, ainsi que j'ai eu souvent l'occasion, de le developper; il se borne á n'en avoir aucun d'immuable, mais á defendre ou permette cette exportation selon le temps and selon les circonstances." When a man starts upon a rotten foundation, he is sure to flounder in this manner; the simpli-

Imports.		*Exports.*	
Wheat,	8,116,000 liv.	Corn,	3,165,600 liv.
Rice	2,040,000	Wheat,	6,559.900
Barley,	375,000	Legumes,	949,200
Legumes,	945,000		
	11,476,000		10,674,700

This account shows pretty clearly how well founded the minister was, when he attempted to throw on the wise measures of his predecessor the mischiefs which arose from his own pernicious prejudice alone; and how the liberty of commerce, which had taken place most advantageously in consequence of the free trade in 1787, had been more an import trade than an export one; and, of course, it shows, that when he advised his sovereign to prohibit that trade, he acted directly contrary even to his own principles; and he did this at the hazard of raising a general alarm in the kingdom, which is always of worse consequence than any possible export. His whole conduct, therefore, was one continued series of such errors, as can, in a sensible man, be attributed only to the predominant vanity that instigated him to hazard the welfare of a great nation to defend a treatise of his own composition. But as this minister thought proper to change the system of a natural export and import, and to spread, by his measures, an alarm amongst the people, that seemed to confirm their own apprehensions, let us next examine what he did to cure the evils he had thus created. He imported, at the enormous expence of 45,543,697 liv. (about 2,00[illegible]00 sterling) the quantity of 1,404,463 quintals of corn of all sorts, which, at 240 lb. make 585,192 *septiers*, sufficient to feed no more than 195,064 people a year. At three *septiers* per head, for the population of 26 millions of mouths, this supply, thus egregiously boasted of, would not, by 55,908 *septiers* feed France even for three days; for her daily consumption is 213,700 *septiers*: nor have I the least doubt of more persons dying of famine, in consequence of his measures, than all the corn he procured would feed for a year.* So absolutely contemptible is all importation as a remedy for famine! and so utterly ridiculous is the idea of preventing your own people from being starved, by allowing an import, which, in its greatest and most forced quantities, bears so trifling a proportion to the consumption of a whole people, even when bribed, rather than bought, from every country in Europe! But a conclusion

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city of a system to be new-moulded every moment, "selon le temps and selon les circonstances!" And who is to judge of these seasons and circumstances? A minister? A government? These, it seems, are to promulgate laws, in consequence of their having *made inquiries into the state of crops and stocks on hand.* What presumption; what an excess of vanity must it be, which impels a man to suppose, that the truth is within the verge of such inquiries; or, that he is one line, one point nearer to it, after he has made them than before he began. Go to the Intendant in France, or to the Lord Lieutenant in England, and suppose him to receive a letter from government directing such inquiries;—pursue the intelligence,—follow him to his table for conversation on crops,—or in his rides among the farmers (an idea that may obtain in England, but never was such a ride taken by an Intendant in France) in order to make inquiries; mark the desultory, broken, and false specimens of the intelligence he receives, and then recur to the *simplicity* of the system that is to be founded on such inquiries. Mons. Necker writes as if we are ignorant of the sources of his information. He ought to have known, that ministers can never procure it; and that they cannot be so good an authority for a whole kingdom, as a country gentleman, skilled in agriculture, is for his own parish; yet what gentleman would presume to pronounce upon a crop to the 860th part of its amount, or even to the 20th? But it must be observed, that all Mons. Necker's *simple* operations, which caused an unlimited import, at an unlimited expense, affected not the 200th part of a year's consumption by the people, whose welfare he took upon him to superintend. If this plain fact—the undoubted ignorance of every man what the crop is, or has been, in such fractions as one-twentieth, one-thirtieth, one-fortieth, and much more one-two-hundredth, be well considered, it will surely follow, that an absolute and unbounded liberty in the corn trade is infinitely more likely to have effect, than such paltry, deceitful, and false inquiries as this minister, with his system of complex *simplicity*, was forced, according to his own account, to rely upon. Let the reader pursue the passage, p. 360, the *prévoyance* of government—*application—hâter le mouvement du commerce—attrait prochain—calculs*. A pretty support for a great nation! Their subsistence is to depend on the combination of a visionary declaimer, rather than on the industry and energy of *their own* exertions. Mons. Necker's performance deserves an attentive perusal, especially when he paints so pathetically the anxieties he suffered on account of the want of corn. I wish that those who read it would only carry in their minds this undoubted fact, that the scarcity which occasioned these inquietudes was absolutely and solely of his own creating; and that if he had not been minister in France, and that government had taken no step whatever in this affair, there would not have been such a word as scarcity heard in the kingdom. He converted, by his management, an ordinarily short crop into a scarcity; and he made that scarcity a famine; to remedy which, he assumes so much merit, as to nauseate a common reader.

* At a moment when there was a great stagnation in every sort of employment, a high price of bread, instead of a moderate one, must have destroyed many; there was no doubt of great numbers dying for want in every part of the kingdom.

of much greater importance is to be deduced from these curious facts, in the most explicit confirmation of the preceding principles, that all *great* variations in the price of corn are engendered by apprehension, and do not depend on the quantity in the markets. The report of Mons. Necker's measures, we have found, did not sink, but raised the price: providing France with less than three days' bread, when blazed forth with all the apparatus of government, actually *raised* the price in the markets, where I was a witness, 25 per cent. Of what possible consequence was three days' provision added to the national stock, when compared with the misery and famine implied—and which actually took place in consequence of pushing the price up so enormously, by Mons. Necker's measures? Would it not have been infinitely wiser never to have stopped the trade, which I have proved to have been a trade of import?—Never to have expressed any solicitude?—Never to have taken any public steps, but to have let the demand and supply quietly meet, without noise and without parade? The consequence would have been, saving 45 millions of public money, and the lives of some hundred thousands, starved by the high price that was created, even without a scarcity; for I am firmly persuaded, that if no public step whatever had been taken, and the archbishop of Sens' edict never repealed, the price of wheat in no part of France would have seen, in 1789, so high a rate as 30 liv. instead of rising to 50 and 57 liv. If there is any truth in these principles, what are we to think of the first minister hunting after a little popularity, and boasting, in his *Memoire*, that the king allowed only bread of wheat and rye mixed to be served at his own table? What were the conclusions to be looked for in the people, but that, if such were the extremities to which France was reduced, all were in danger of death for want of bread. The consequence is palpable;—a blind rage against monopolizers, hanging bakers, seizing barges, and setting fire to magazines; and the inevitable effect of a sudden and enormous rise in the price, wherever such measures are precipitated by the populace, who never are truly active but in their own destruction. It was the same spirit that dictated the following passage, in the *Memoire instructife*—"*Les accaparements sont la premiere cause á la quelle la multitude attribue la cherté des grains, et en effet on a souvent eu lieu de se plaindre de la cupidité des speculateurs.*" I cannot read these lines, which are as untrue in fact as erroneous in argument, without indignation. The multitude *never* have to complain of speculators; they are *always* greatly indebted to them. *There is no such thing as monopolizing corn but to the benefit of the people.*[*] And all the evils of the year 1789 would have been prevented, if monopolizers, by raising the price in the preceding autumn, and by lessening the consumption, had divided the supply more equally through the year. In a country like France, sub-divided mischievously into little farms, the quantity of corn in the markets in autumn is always beyond the proportion reserved for supplying the rest of the year: of this evil, the best remedy is, enlarging the size of farms; but when this does not take place, the dealings of monopolizers are the only resource. They buy when corn is cheap, in order *to hoard it* till it is dear; this is their speculation, and it is precisely the conduct that keeps the people from starving; all imaginable encouragement should be given to such merchants, whose business answers every purpose of public granaries, without any of the evils that are sure to flow from them. It may easily be conceived, that in a country where the people live almost entirely on bread, and the blind proceedings of mobs are encouraged by *arrets* of parliaments, seconded by such blunders of government as I have described, and unaided by the beneficial existence of real monopolizers—it may easily be conceived, I say, that the supply must be irregular, and in many instances insufficient: it must be insufficient, exactly in proportion to the violence of the populace; and a very high price will be the unavoidable consequence, whatever may be the quantity in the kingdom. In June and July 1789, the markets were not opened before troops arrived to protect the farmers from having their corn seized; and the magistrates, to avoid insurrections among the people, set the assize too low upon corn, bread, and butcher's meat; that is they fixed the prices at which they were to be sold, which is a most pernicious regulation. The farmers, in consequence, refrained from going to market, in order to sell their wheat at home at the best price they could get, which was of course much higher than the assize of the markets. How well these principles, which such ample experience proves to be just, are understood in France, may be collected from the *cahiers*, * many of which demand measures which, if really pursued, would spread absolute famine through every province in the kingdom. It is demanded at one place, "that as France is exposed to the rigors of famine, every farmer should be obliged to register his crop of every kind, *gerbs*, *bottes*, *muids*, &c.; and also every month the quantity sold." Another requires, "the export be severely prohibited, as well as the circulation from province to province; and that importation be always allowed." A third, "that the severest laws be passed against monopolizers; a circumstance, which at present desolates the kingdom." A system of prohibition of export is demanded by no less than twelve *cahiers*. And fifteen demand the erection of public magazines. † Of all solecisms, none ever equalled Paris demanding that the transport of corn from province to province should be prohibited. Such a request is really edifying, by offering to the attention of the philosophical observer, mankind under a new feature, worthy of the knowledge and intelligence that ought to reign in the capital of a great empire; and Mons. Necker was exactly suited to be minister in the corn department of such a city!

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[*] I am much inclined to believe, that no sort of monopoly ever was, or ever can be injurious, without the assistance of government; and that government never tends in the least to favor a monopoly without doing infinite mischief. We have heard in England of attempts to monopolize hemp, alum, cotton, and many other articles; ill-conceived speculations, that always ended in the ruin of schemers, and eventually did good, as I could show, if this were the proper place. But to monopolize any article of common and daily supply and consumption, to a mischievous degree, is absolutely impossible: to buy large quantities, at the cheapest season of the year, in order to hoard and bring them out at the very dearest moment, is the idea of a monopolizer or *accapareur;* this is, of all other transactions, the most beneficial towards an equal supply. The wheat which such a man buys is cheap, or he would not buy it with a view to profit. What does he then? He takes *from* the market a portion, when the supply is large; and he brings that portion *to* the market when the supply is small; and for doing this you hang him as an enemy. Why? Because he has made a private profit, perhaps a very great one, by coming in between the farmer and the consumer. What should induce him to carry on his business, except the desire of profit? But the benefit of the people is exactly in proportion to the greatness of that profit, since it arises directly from the low price of corn at one season, and the dearness of it at another. Most clearly any trade which tends to level this inequality is advantageous in proportion as it effects it. By buying great quantities when cheap, the price is raised, and the *consumption forced to be more sparing:* this circumstance can alone save the people from famine; if, when the crop is scanty, the people consume plentifully in autumn, they must inevitably starve in summer; and they certainly will consume plentifully if corn is cheap. Government cannot step in and say, you shall now eat half a pound of bread only, that you may not by-and-by be put to half an ounce. Government cannot do this without erecting [public] granaries, which we know, by the experience of all Europe, is a most pernicious system, and done at an expense which, if laid out in premiums encouraging cultivation, would convert deserts into fruitful corn-fields. But private monopolizers can and do effect it; for by their purchases in cheap months they raise the price, and exactly in that proportion lessen the consumption; this is the great object, for nothing else can make a short crop hold out through the year; when once this is effected, the people are safe; they may pay very dear afterwards, but the corn will be forth-coming, and they will have it, though at a high price. But reverse the medal, and suppose no monopolizers; in such a case, the cheapness in autumn continuing, the free consumption would continue with it; and an undue portion being eaten in winter, the summer would come without its supply: this was manifestly the history of 1789; the people enraged at the idea of monopolizers, not at their real existence (for the nation was starving for want of them,) hung the miserable dealers, on the idea of their having done what they were utterly unable to do. Thus, with such a system of small farms as empty the whole crop into the markets in autumn, and make no reserve for summer, there is no possible remedy, but many and great monopolizers, who are beneficial to the public exactly in proportion to their profits. But in a country like England, divided into large farms, such corn dealers are not equally wanted; the farmers are rich enough to wait for their returns, and keep a due reserve in stacks to be thrashed in summer; the best of all methods of keeping corn, and the only one in which it receives no damage.

The conclusions to be drawn from the whole business, are evident enough. There is but one policy which can secure a supply with entire safety to a kingdom so populous and so ill cultivated as France, with so large a portion of its territory under wood and vines; the policy I mean is an entire and absolute liberty of export and import at all times, and at all prices, to be persisted in with the same unremitted firmness that has not only rescued Tuscany from the jaws of periodical famines, but has given her eighteen years of plenty, without the intervention of a moment's want. A great and important experiment! and if it has answered in such a mountainous, and, on comparison with France, a barren territory, though full of people, assuredly it would fulfil every hope, in so noble and fertile a kingdom as France. But to secure a regular and certain supply, it is necessary that the farmer be equally secure of a steady and good price. The average price in France vibrates between 18 and 22 liv. a *septier* of 240 lb. I made inquiries through many provinces in 1789, into the common price, as well as that of the moment, and found (reducing their measures to the *septier* of 240 lb.;) that the mean price in Champagne is 18 liv.; in Loraine 17½; in Alsace 22 liv.; in Franche Compté 20 liv.; in Bourgogne 18 liv.; at Avignon, &c. 24; at Paris, I believe, it may be calculated at 19 liv. Perhaps the price, through the whole kingdom, would be found to be about 20 liv. Now, without entering into any analysis of the subject, or forming any comparison with other countries, France ought to know, at least she has dearly learned from experience, that this is not a price sufficient to give such encouragement to the farmers as to secure her a certainty of supply: no nation can have enough without a surplus: and no surplus will ever be raised, where there is not a free [export] corn trade. The object, therefore, of an absolutely free export, is to secure the home supply. The mere profit of selling corn is *no* object—it is less than none; for the right use *thereof* is to feed your *own* people. But they cannot be fed, if the farmers have *not* encouragement to improve their agriculture; and this encouragement must certainly be of a good price. Experience has proved sufficiently, that 20 liv. *will not* do. An absolute freedom of interior circulation is so obviously necessary, that to name it is sufficient.

A great and decided encouragement to monopolizers is as necessary to the regular *supply*, as that seed should be sown to procure a crop; but reaping, in order to load the markets in winter, and to starve the people in summer, can be remedied by no other person but an *accapareur*. * While such men are therefore objects of public hatred; while even laws are in force against them, (the most preposterous that can disgrace a people, since they are made by the mouth, against the hand for lifting food to it,) no regular supply can be looked for. We may expect to see famine periodical, in a kingdom governed by the *principles* which must take place, where the populace rule not by enlightened representatives, but by the violence of their ignorant and unmanageable wills. Paris governs the National Assembly; and the mass of the people, in great cities, are all alike, absolutely ignorant how they are fed; and whether the bread they eat be gathered like acorns from a tree, or rained from the clouds, they are well convinced, that God Almighty sends the bread, and that they have the best possible right to eat it. The courts of London aldermen and common council-men have, in every period, reasoned just like the populace of Paris. The present system of France, relative to agriculture, is curious—To encourage investments in land—*tax it three hundred millions.* To enable the land to pay it—*prohibit the export of corn.* That cultivation may be rich and spirited—*encourage small farms.* That cattle may be plentiful—*forbid the enclosure of commons.* And that the supply of the markets may be equal in summer as in winter—*hang all monopolizers.* Such may be called the agricultural code of the new government of France. But there is reasonable ground to imagine, as well as to hope, that such a system will not be persevered in.

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* Instructions to the deputies to the National Assembly.—Ed.

† I have lately seen (January, 1792;) in a public print, the mention of a proposal of one of the ministers to erect public magazines; there wants nothing else to complete the system of absurdity in relation to corn which has infested that fine kingdom. Magazines can do nothing more than private *accapareurs;* they can only buy when corn is cheap, and sell when it is dear; but they do this at such a vast expence, and with so little economy, that if they do not take an equal advantage and profit with private speculators, they must demand an enormous tax to enable them to carry on their business; and if they *do* take such profit, the people are never the better for them. Mr. Symonds, in his paper on the public magazines of Italy, has proved them to be every where nuisances. See *Annals of Agriculture*, vol. xiii, p. 299, &c.

* The word *speculator*, in various passages of this chapter, would be as proper as *monopolizer*, they mean the same thing as *accapareur*—a man who buys corn with a view to selling it at a higher price; whatever term is used, the thing meant is every where understood.

ANNUAL REPORT OF THE BOARD OF DIRECTORS OF THE PETERSBURG RAIL ROAD COMPANY.

In obedience to that wise provision of our charter, which requires the president and directors to render distinct accounts of their disbursements and proceedings to the stockholders, at their annual meeting, we now beg leave to submit to your scrutiny, full and detailed statements of all the matters entrusted to our care, connected with the operations of this company, during the past year; and trust, after you have given them an examination, they will be approved and sanctioned.

The board have pleasure in stating, that the condition of the company is as prosperous as at any former period; and although they have not been entirely exempt from calamity, they nevertheless believe your affairs generally will sustain a proud comparison with those of similar works in this or any other country. So far as the control of the board extended, they perceive nothing, on a review of the past, which they could advantageously have changed.

The board deplore the loss, caused by the fire in November last. Its origin has not been ascertained—but whether it resulted from carelessness or crime, it ought not to have occurred, and would have been averted, but for the unpardonable neglect of a faithless watchman. The board have been always careful in selecting their watchmen, and the person in charge of the premises on the night of the calamity, was believed to be as trustworthy as any who could be procured for such service. Experience teaches us that there is great difficulty in obtaining the services of men who can be entirely relied upon, and who are willing to submit to the hardships and exposure attendant upon the honest discharge of this duty.

The actual loss sustained by the company in consequence of the fire is, as near as we can estimate it, about $ 10,000. The buildings were insured for $ 1560, which amount has been recovered. We have had, and still continue to have, some additional expense to incur, for the want of our shops, being frequently obliged to send work elsewhere to be repaired; and having been compelled to erect temporary structures for our purposes, the amount of our disbursements on this account will necessarily be increased.[*]

The board have the satisfaction to state, that notwithstanding the trouble entailed upon them by this calamity, and the great inconveniences the company have been subject to, at the time and since, in consequence of it, their regular business, and transportation and travel, have been regularly met, without any interruption. No trip has been lost, no delay permitted, and the regularity with which the great and express mails have been carried, have even elicited from the head of the post office department, an approving compliment.

Contracts have been entered into for rebuilding the shops and engine house, and in the course of the present season all will be replaced, on an enlarged, secure, and approved plan, with additional machinery and fixtures, so that when completed, we shall have the power to do all of our own repairs and work, a large portion of which, we have hitherto sent abroad, to be executed at great additional cost. These buildings and machinery are estimated to cost $ 15,000. It would be desirable to erect the warehouse at the corner of Washington and Walnut streets during the present season, and although it is almost absolutely necessary for our present and increasing business, the board have not yet decided upon the propriety of contracting for it under existing circumstances. If not completed this season, it must only be deferred until the next. The cost of this warehouse will be about $ 7000.

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[*] The fire was discovered about 1 o'clock, in the night (November 28th,) when too much advanced for its progress to be stopped, or for any thing to be removed from the buildings on fire. All the work shops, machinery, and tools, were consumed, and also, a quantity of materials for repairs. The fire was burning until after the time for the starting of the regular mail train, at 9 A. M., but which was not thereby delayed a minute. There were six locomotive engines then in the depot, of which five were in the engine house, and were exposed to all the fury of the fire. Before they could be examined, and judging from the violent heat to which they had been exposed, it was supposed that the engines would be totally worthless, and past repair. But though, of course, greatly injured, and much of the metal either melted, or mis-shapen by bending, when in its softened state, the damages to most of them were so soon repaired that not a single trip was lost in consequence of this sudden and great loss, and there was no detention or delay thereby caused, either to the mails, passengers, or commodities to be transported. Of the two engines which only were not burnt, one belonged to this company, and the other had been sent from Liverpool to this place by mistake, it having been designed for the Winchester rail way—and it was taken away in the course of the week succeeding the fire, then leaving for use one engine only, besides those which had been burnt, but of which one had already been repaired, and put again on the road. The single engine belonging to the Petersburg Rail Road Company which was not burnt, escaped by being then at the other end of the road, 60 miles distant. This engine brought in the train the evening of the day of the fire. These facts furnish strong evidence of the capacity and energy of the officers of the company—of the *good management*, which is the most important item in the affairs of rail road companies, though it is never counted as any thing in the estimates of engineers or of others who plan such works, and calculate their returns.—Ed. Far. Reg.

Under the authority of the resolution adopted at your last general meeting, the board have made arrangements with the board of the Greensville and Roanoke Rail Road Co., to do the transportation on their road, and are prepared to discharge their obligation the moment that road is finished; no permanent contract, however, has been entered into, as some difference of opinion existed as to the value of the labor and the amount of capital which would be requisite, and consequently the proportion of the receipts each company would be justly entitled to. It was deemed safest, therefore, to waive completing these arrangements, until it was ascertained, by fair experiment, what should be the just distribution of the receipts between these separate companies, and no difficulty is apprehended in adjusting the proper proportion in such a manner, as will satisfy and prove mutually advantageous to the stockholders of each company.

With the Raleigh and Gaston Rail Road Co., the basis of an arrangement for this company doing their transportation, has been agreed upon. A bill giving us the power to make this contract, is now before the legislature, and no doubt is entertained of its passage, and all that remains to enable the board to enter at once into the proposed contract, is your sanction and authority. That you may understand the arrangement, the board have simply to state, that this company have agreed to furnish all the locomotives, cars, and coaches, &c. that may be required, and provide all proper train and depot agents along the line, for one half of the gross receipts arising from the transportation of produce and the mails, and for one third of the travel—the Raleigh and Gaston company, binding themselves to keep their road, depots, &c., in good order, at their own expense, and of course, furnishing the requisite labor and superintendence for this purpose. This arrangement is believed by the board to be highly advantageous to the respective companies; to this company, because it will require comparatively but a moderate addition to the power required for the transportation on our own road, to meet the business on theirs, and by concentrating in our own shops, all the repairs, for the whole line of road, give us the means and facilities to have them attended to in a more effectual, prompt and economical manner: and the Raleigh and Gaston Co. will therefore be saved the heavy expenditure for shops, machinery, locomotives, cars, and workmen, and greatly economize their labor and superintendence, besides having at command the requisite power and means to render their road, or any part of it, immediately available and profitable. Situated as we are, in the vicinity of the coal region, and of the large and long established foundries and furnishing shops of Richmond, and those now erecting in this place, we have facilities which they cannot possess for a long time to come; and identified in interest as these two companies are, the board are disposed to promote the welfare of their offspring, to the extent of their ability—the more especially in the present proposed arrangement, as it will in their opinion, greatly enhance the profits of our own stockholders. The board, therefore, recommend the adoption of a resolution, sanctioning the arrangement which they have made, and giving the necessary authority to carry it into effect.

You are already informed of the charter of the Raleigh and Columbia Rail Road Co., granted by the last legislature of the state of North Carolina. This road continues the Raleigh and Gaston road to the South Carolina line, and a sufficient sum, we understand has been already subscribed to secure the charter. This being another link in the great chain of communication between the north and the south, deserves the support of the stockholders of all the companies on its line of connection, and so important must it be deemed by them, that no doubt exists on the minds of your board, that it will receive the patronage it deserves, and be urged forward with becoming energy and zeal. The citizens of Cheraw are now causing a survey to be made, for a road from the vicinity of the Waccamaw, which carries them within six hours sail of Charleston; and another survey is making from the Yadkin to Fayetteville. Should these improvements ever be made, it is more than probable that the southern terminus of the Raleigh and Columbia road will connect with the former, and will intersect the latter forty miles west of Fayetteville; thus securing to our line, all these auxiliaries, without deviating from the original purpose of a great continuous north and south mail line. Nor should we omit to announce to you that the Danville and Junction Rail Road Co., has been organized with good prospect of success, and although mentioned here among the last of the connecting roads, it is by no means reckoned by us the least in its importance. We should earnestly desire its success, and feel deeply solicitous that every effort should be made to strengthen and sustain it.

At your last meeting, a resolution was adopted, authorizing the board of directors to borrow any sum not exceeding $ 60,000, to improve our own means of transportation, and to meet the demands of the trade and travel on the Greensville and Roanoke road. In consequence of the state of the money market during the past year, the board were convinced of the inutility of any application to borrow money at a fair rate of interest, and consequently made no effort to procure it.

The delays which have occurred in the execution of the orders transmitted to England for machinery, rendered a loan less necessary, our own resources proving, until recently, sufficient to meet all the immediate wants of the company. The board being advised within the past few months of their orders being nearly complete, and having received, recently, two locomotives, and wheels and axles for twenty cars, determined, if possible, to make the loan authorized by you; but up to this time, they have been unsuccessful in their applications, although they have asked wherever a hope could be indulged of the probability of success. The board, it is true, have been favored with some temporary loans, as the accounts before you exhibit; but all these are expected to be returned in a short time and were granted on this express condition.

The stockholders will perceive, that with our amount of capital, always too limited, but wisely not extended, the impossibility of meeting our own expenses, paying large dividends semi-annually, and at the same time from our own income making the requisite investments to carry on the great transportation of roads connected with us, double our own in extent. This cannot be expected, and at the same time the benefit resulting to the stockholders in this company undertaking this transportation, notwithstanding this impediment, is too apparent to need argument to prove it.

The board would therefore recommend a permanent loan of $ 100,000, which would be sufficient for all the wants of the company, and would advise that the effort to procure it should be renewed—but if the attempt prove again unsuccessful, they see no alternative but to withhold the dividends for the present.

Should a loan be made, the future income of the company will be ample to pay off the debt in a short time, meet all demands, and give to the stockholders full and fair dividends, besides returning to them as a bonus, in the shape of stock, the fund already invested in capital, amounting now to $ 47,167 14 and which has hitherto been abstracted from their profits. But should the loan not be made, and the payment of the dividends be deferred, the board entertain the opinion, that so soon as their engagements with these new companies are fully entered into, the maximum rate of dividend (15 per cent.) will at once be attained.

Contracts have been made with the post office department for the transportation of both the great and the express mails, by one and the same train, at $ 300 per mile. At the time this contract was entered into, the department did not feel itself authorized, in consequence of its existing contract with the stage and steamboat owners between Washington and Richmond, to allow the Richmond and Fredericksburg Rail Road Co. more than $ 150 per mile, for their transportation of the great mail; and as it was very important for this company that the travel and the mails should come on at one and the same time, and the department consenting to arrange the schedule of the great and express mails so that both should be carried by this company in one and the same train, the board deemed it judicious, in order to attain this object, to agree to allow, out of this contract, $ 50 per mile to the Richmond and Fredericksburg Rail Road Co., they being unwilling to accept less than $ 200 per mile, and the department declining to give the one company the contract, without the other. The board hope this matter will be hereafter remedied; but in the mean time, believe the sacrifice they have been called upon to make, satisfactory and proper, under all the circumstances.

The various accounts before you, exhibit, in every aspect, the affairs of the company, and show their situation so fully and clearly, as to need no explanation.

The expenses of the company the past year, have been $ 45,330 79, the total receipts $ 108,342 19—exceeding the receipts of the preceeding year, $ 4081 70, notwithstanding the great diminution of the crops of tobacco and corn by frost, and freshets unprecedented for their devastations on the Roanoke, and the entire destruction of the wheat crop, throughout the country tributary to our road, as elsewhere in Virginia. The increase from travel is more than 14 per cent. an increase greater than could have been anticipated, in consequence of the numerous difficulties hitherto prevailing both north and south of us. These, are now being removed, and we feel warranted in saying that our income from this source presently will be vastly augmented, its increase being daily perceptible.

The estimate of our expenses for the current year, amounting to $ 60,931 16 is submitted to you. In common with all the world, we feel the pressure of the times. The great advance in the price of labor, timber and materials of all kinds, causes this estimate to exceed that of the past year.

The repairs of the road have been greater than was anticipated, although the general estimate is scarcely exceeded.

Accompanying this report, is a statement of the number of feet of railing and iron, and the number of spikes and sills used on the road the past year. You have likewise submitted to you the quantity of provisions consumed by the laborers attached to the company, for the year ending 30th December, and the quantity on hand at that date.

We have on hand eight locomotives, two of which have just arrived from Liverpool. All, save one, are in good condition. Two others, expected from England in the course of the present year, complete our orders. Our smallest locomotive was disposed of by the board during the past year, for $ 6000, (rather more than cost,) its power being too limited for our heavy grades and transportation.

We have 120 cars in daily use, 5 having been destroyed by the fire, and have wheels and axles for 55 more. When these and the 20 additional sets which are expected, are fitted up and mounted, we will then have a sufficient number for all future business.

With two additional engines, and six additional coaches, we believe, we shall be fully prepared to do all the business of our own road, the Greensville and Roanoke Rail Road, and the Raleigh and Gaston Rail Road.

The board, in conclusion, beg leave to state, that the officers, agents, and all others in the employ of the company, with the exception mentioned, have faithfully performed the several duties assigned to each, during the past year. They have, in no instance, permitted fatigue, discouragements or difficulties, to relax, damp or retard their efforts, in the promotion of your interest; but have uniformly displayed purposes inflexible, and manners conciliatory, in the proper discharge of every appointed duty. Their alacrity, zeal, and fidelity well deserve this tribute, and your especial notice.

By order of the board of directors,
CHARLES F. OSBORNE, President.

[In accordance with the recommendations of the foregoing report, the following resolutions were adopted unanimously by the stockholders.]

Resolved, That the President and Directors be, and they are hereby authorized to make such arrangements and contracts with the Board of Directors of the Raleigh and Gaston Rail Road Co., as in their opinion are expedient and advantageous to the general interests of this company.

Resolved, That the President and Directors be requested to renew the application for the loan authorized by the resolution adopted at the last annual meeting, and in addition thereto, to borrow any further sum or sums, which in their opinion may be requisite to complete the arrangements for the transportation upon the Greensville and Roanoke Rail Road, and upon the Raleigh and Gaston Rail Road; provided the sum or sums so borrowed, shall not exceed the sum of one hundred thousand dollars.

Transportation on the Petersburg Rail Road, for the year ending 31*st January*, 1837.

	Bales Cotton.	Hhds. Tobac.	Bushels Grain.	Bbls. Flour.	Freight.	Passengers.	Total.
February, 1836, . .	1019	214	371	56	$2523 89	$2181 79	
March, . . .	2332	638	1370	1137	7047 72	2761 81	
April, . . .	2967	618	621	713	8380 15	2830 16	
May, . . .	1299	856	584	306	6348 96	2630 81	
June, . . .	561	740	467	324	5030 44	2160 18	
July, . . .	209	1079	45	320	6667 66	2521 81	
August, . . .	222	697	1429	79	4534 56	2999 51	
September, . .	154	446	1666		4163 35	3942 28	
October . . .	1029	159	5074		4075 44	3335 78	
November, . .	3398	80	1859	26	5336 25	2495 17	
December, . .	1891	106	494	112	3619 70	2668 61	
January, 1837, . .	699	49	477		1752 35	2649 89	
	15780	5682	14457	3073	$59479 97	$33177 30	$92,657 25
Storage, - - - - - - - -							93 53
Transportation of the mail, - - - - - -							11,666 67
From other sources, - - - - - - -							2,601 31
							$107,018 83
Divided in May, - - - - - -						$30,275 00	
in November, - - - - -						30,275 00	
Charges on Transportation, - - - - -						45,330 79	
Balance, being surplus undivided, - - - -						1,138 4	$107,018 83
Profits of the boats for 1836. - - - - - - -							$1.323 36

Losses by fire and otherwise in 1834, $5,041
Do. do. 1835, 1,174
Do. do. 1836, 481 of this sum, $356 is for the construction of temporary buildings in the place of those burnt.

Comparative statement of Transportation in 1835, *and* 1836.

	1835.	1836.
Of Produce including Storage, - - - - -	$64,052 92	$62,174 96
Of Passengers, - - - - - - -	28,948 81	33,177 30
Of the Mail, - - - - - - -	10,000 00	11,666 67
Profits from Steamboats, - - - - - -	1,258 76	1,323 36
	$104,260 49	$108,342 19 *

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* Several other tabular statements of the financial affairs of the company, which accompanied the report, are omitted here, but will be given in the forthcoming pamphlet edition.—Ed.

THE EFFECTS OF TURNING UP THE SUBSOIL IN NEW LAND, FOR TOBACCO.

To the Editor of the Farmers' Register.

Orange, March 2d, 1837.

As the falling of snow prevents me from attending to my agricultural concerns this evening, I have determined to give you an account of two crops of tobacco of last year's growth, which came under my observation; from which, I flatter myself the younger part of your readers may at least derive some benefit.

The first was my own. The part of which I am now speaking was a ridge somewhat sandy and far from being good tobacco land; but as it would have shaded some very good land, I was forced to cultivate it. Being doubtful of its capacity for a tobacco crop, and having often heard of the deleterious effect on the first crop of the too free admission of clay into the soil, I determined to confine the preparation of the soil entirely to the coulter, with which the land was well broken. When thus broken, the roots were removed and the land laid off three feet four inches each way. After this process was completed, we commenced hilling, which was done in this way: the four corners of the square were first drawn to the point on which the right foot was placed which constituted the centre of the hill, and then the cone was made of as much of the other earth as was requisite. My object in thus managing my land was to have a bed of good soil for the roots of the plant to spread in, which is, you see, thus easily accomplished; for the hill is cut off to at least half its height, leaving the hill so reduced that the plant soon strikes its roots to the soil prepared for it *by the drawing up of the corners*, and thus finds sustenance far beyond that which the mixed soil could possibly afford, as my crop completely proved. In corroboration of this, I will mention another experiment which we tried. It was in land quite poor naturally, but which had been somewhat improved by having the timber cut down on it for a year. This piece, until the middle of July, was considered but a poor piece of tobacco—so much so indeed, that I had proceeded to top it to five and six leaves, but was surprised after that time to see the result. It was of handsome size. To what could this have been ascribed, but to the collection of the soil which was made by having the surface undisturbed in the first place by the plough, and then its collection afterwards? An old neighbor remarked to me, that in the whole course of his experience he had never seen such an improvement.

I come now to the second crop, which, though not grown by me, was so much under my observation, that I can give its history as accurately as if it had been my own. The soil on which it grew, was just such as the one of which I first spoke, (that is sandy and only common land)—with this exception, that it had the advantage of having the timber and brush and leaves upon it for a year. This land had been twice coultered as mine had been, and then its owner, notwithstanding my entreaties, had it nicely ploughed with the shovel plough, and then nicely harrowed over. These several operations put such a handsome face on it, that I must confess it often made me less confident of the propriety of my course of management than I had at first been; but I had made a move that precluded retreat, and so tried to feel reconciled; and it was a blessing to me that I was so situated as the above results have shown, and this last crop *will* show; for it was a complete failure in *looks and in result*, for it was estimated that in this piece there were two acres or more of land from which the proprietor did not expect six hundred pounds of good tobacco, though a good valley ran through it.

AGRICOLA.

INDIAN CORN AND POTATOES MADE WITHOUT TILLAGE.

To the Editor of the Farmers' Register.

"The progressive steps in agriculture are, and ought to be, slow; and it is contrary to the counsels of wisdom and prudence to wish to deviate from customs rendered sacred by time, until the new modes to be adopted shall have received the sanction of successful experiment.

"The reproach which is every day made to the husbandman of his indifference towards new modes of culture, appear to me not to be well founded. He wishes first, to see and compare them with the methods to which he has been accustomed. He has neither the knowledge nor the means of forming, beforehand, a just estimate of the advantages which they offer to him. He perseveres, then, in his old course till some neighbor, richer and more enlightened than himself, is able to present to him, by the new mode, results more advantageous than he has abtained from his own.

"Example is the only lesson profitable to a husbandman. When one is placed before his eyes, and his reason is convinced of its goodness, he is not slow to follow it; and by no other way than this can improved methods of agriculture be introduced and propagated."—*Chaptal's Agricul. Chem.—Introduc.*

Mr. Editor:—There is sound philosophy in every line of the preceding extracts; and hence, I am neither disappointed nor displeased at the distrust with which my proposition to raise Indian corn, without tillage, has been received.* It was so entirely new—so directly at variance with all the long-established opinions on the subject, that it would have been almost a miracle if it had been received otherwise than with distrust—nay, even with ridicule.

I have persevered. Last summer I acted on the same principles, varying the practice in nothing except in the manner of planting. It seemed to me that the great products of the northern states might, by my practice, be realized here. I accordingly adopted the manner of planting by which the Messrs. Pratts, of Madison county, N. Y., are represented by Judge Buel, to have raised *one hundred and twenty* bushels to the acre, varying it only so as to suit the strength of my soil. I planted in triple drills, (the same ground as last year,) four feet apart from centre to centre, leaving the stalks nine inches apart in the drill. The whole will be better understood by the following diagram:

a . . . .
b . . . .
c . . . .

d . . . .
e . . . .
f . . . .

The single drills, *a*, *b*, *c*, and *d*, *e*, *f*, are nine inches apart, and the stalks, represented by dots, are nine inches apart. From the centre drill *b* to the centre drill *e*, is four feet. I planted two grains in a place, afterward removing the inferior stalk, so as to have only one. When the corn was about twelve inches high, I spread a small quantity of stable yard manure, on the surface of the ground, among the stalks, and then covered the whole surface with leaves four or five inches thick, as described in my former communication. The whole was left undisturbed until the corn was ripe. When gathered and carefully measured, it turned out to be a product at the rate of *seventy* bushels to the acre. Last year it was *forty-two.*

I have succeeded in raising and keeping through the winter, as fine Irish potatoes as I ever saw in the northern states. And I have come to the conclusion, that no man in the southern states need spend a dollar in the purchase of potatoes, except occasionally for seed; for even where they are most successfully produced, it is found to be best to change seed every two or three years.

The potato requires a moist, cool, loose soil.

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* For the account of Mr. Camak's first experiment, see his communication at page 454, vol. 3, Farmers' Register.

The common practice in the south is to plant in ridges, and we take no care to protect the plant from our scorching sun: the consequence is, that in dry, hot weather, the plant is wilted, and cannot, therefore, properly perform its office in preparing the matter to be deposited in the tuber below the soil: the consequence of this is, that in summer we eat imperfect or diseased potatoes, and we fail to keep them in winter, for the very same reason that we would fail to keep an imperfect or diseased apple, or ear of corn. I have attempted to avoid these consequences. Ridges are necessary in England and Ireland (both moist climates) for purposes of drainage. Our climate, being hot and dry, requires the opposite practice. I plant in trenches twelve or eighteen inches deep according to soil, and put stable manure at the bottom, on which the potatoes are planted. The trenches are then filled up with leaves, straw, shucks, &c., and these covered slightly with earth, taking care to leave the ground highest between the rows. When the potatoes are six or eight inches high, the whole surface of the ground is carefully covered with leaves, leaving, of course, the tops of the stalks out. In this way, no heat of summer wilts the leaves. They continue fresh and green. Blossoms are produced in abundance, followed by seed which comes to full maturity. The tubers are large, dry, and of fine flavor; and being dug after the vines are completely dead (about the middle of August) are kept without any trouble all winter, either in barrels or spread on the cellar floor. My first attempt gave me a product at the rate of 300 bushels to the acre; and now, the last of February, I see no difference between them and the best northern potatoes, when brought on the table.

JAMES CAMAK.

Athens, Ga., Feb. 27, 1837.

FARMING ON THE RIVANNA.

No. II.

To the Editor of the Farmers' Register.

March 12*th*, 1837.

Your favor of the 3rd instant, reached me only a few days since, and I avail myself of the first leisure for attending to it. You do injustice both to your press and to Rivanna, in ascribing his silence to "discouragement, from the typographical errors which appeared in his essay of the January number of the Register." He is too well aware of the illegibility of his *hand* to have found fault with your *devil* under any circumstances, but to give him his *due*, more could not reasonably have been expected of him in *this* instance. I was indeed, surprised, considering the carelessness of the production and the *option given* you, to see it in print—and still more so to detect so few *material* inaccuracies. True, some plural *ss*, *articles* and such like unimportant addenda were supplied by the printer, which might grate harshly on the taste of a belles-lettres scholar; but as my reputation as well as interest (luckily for me) rest on the *plough* and not on the pen, these were, to *my sensibility*, venial appendages.

Whilst I cannot decline your invitation to further communication, I must beg leave, in lieu of something original, to take a cursory review of "Rivanna"—which his unworthiness gives me an opportunity of anticipating any one else in doing: if indeed, he might *at all* have expected such a compliment. However glarring the imperfections of his system of husbandry, there may be some *young* farmers *at least*, who are willing to [illegible] experiment of one which is professedly sustained by the writer's experience—and feeling the mite of responsibility this reflection imposes, he is led to the unusual course of reviewing his own work. In explaining those of its defects which strike me as most prominent, I will take them *seriatim*.—Lest I may be misapprehended on my views on corn culture, let me say that the mould-board plough is by *no means* to be recommended *exclusively*, over substratum implements, on the contrary, that the latter are *best* in soils that do not throw up grass and weeds *freely*, and particularly on farms where *labor* is abundant. I am here, Mr. Editor, reminded of one of the typographical errata alluded to—although I believe that more injury is often done to the corn crop by too much than too little work, yet do not say that more than *I give* might not be "*judiciously*," (not injuriously) bestowed. In a comparison of the above mentioned ploughs, undoubtedly, (all other circumstances considered) that which turns out the manure least (whether artificial or a ley) and exposes least to evaporation, is preferable—but on rich land with a *scarcity of labor*, these evils must be endured—nor is the *evaporation* so great as to be much felt under my system of thick planting, on such land—for the crop very soon becomes a *forest* which is almost impenetrable to the sun—in our climate an important consideration.

Next in order come my opinions of the time and manner of sowing grass seed—and first, as to clover. If I have ever known a season in which that grass should have been sown *later* than January, it was the past. Having always practised sowing on a light snow, when it occurred at the proper time, on account of the *latter* regulating the distribution of the seed—I availed myself of such an one, on the 19th of that month. The snow was carried off immediately after, by a sudden thaw which closed the pores of the earth before the seed had reached it—leaving them on the surface exposed to a warm and misty spell *of more* than a week. They swelled and were in a dough state, many of them sprouting. In this condition (as might have been expected) they were caught by a *hard freeze*, which endangered the bursting of the swollen seed, and more certain destruction, as I thought, of the sprouted ones. Notwithstanding this combination of untoward circumstances, the *seed* sown at that time are vegetating as well as could be desired, and are, I believe, more safe from harm, than those sown according to weather and condition of the land, from that period to the present. This result, confirming an experience of twenty years will not *deter* me from sowing hereafter in January, provided the field is in open condition for the reception of seed—*ever* avoiding in future (changeable as our climate has become) the jeopardy of *snow*, as a seed-bed. Clover seed sown on *oat* land in the spring (if clean) will bury themselves sufficiently, immediately after the oats are *harrowed in*—if rain intervenes, I use a *light* harrow.

As regards spear grasses—if sown in firm wheat nds in spring, I would recommend their being overed with *two-horse* harrows. If on *naked* preparation or oat-land, after being harrowed to a tolrably firm state, they should be sown or gotten in vith *one-horse* harrows. I roll seed of every kind n plaster—except clover. These being most exensively used and requiring despatch when the *ime comes* for seeding, are more conveniently ransported and sown in an unmixed state. If a nedium is used for the sake of greater regularity n seeding, I prefer saw-dust made damp, as the seed mix better, and it is more portable than plaster—which, moreover Mr. Editor, I had rather apply "*when*" (and not *where*) the clover assumes three leaves. I consider all steeps hazardous to the vitality of seed, unless when the earth is in a damp and warm state for their reception—believing that when the germinating principle is once excited, the least check enfeebles the plant, more or less. In condemning top-dressing with coarse manure as to its effects on wheat, I must retract so far as, that in such winters as the past, it may more than compensate for the protection it affords to insects, by the warmth of its covering to wheat. But this is yet to be decided when the *tug* comes, which may be apprehended in our backward crops. If, however, they *escape the fly*, I venture to predict a better yield than has been realized for some years. The wheat being less killed as far as I have seen than for several past crops—owing I think, to the continual wet state of the earth, during the most severe weather—having always observed that a *dry* freeze is more destructive than a moist one. I can certainly *retract* nothing from my commendation of plaster—for by it I have seen converted in the short space of four years, a *desert* into an oasis—but I may add to former remarks, that I scatter it at the rate of a bushel per acre on all coarse manures, before ploughing them in, and on none with greater benefit than on leaves. This I have found a medium through which plaster acts with more effect than in combination with any other vegetable matter—reclaiming abraded spots more readily, and certainly at less expense than by any other method I have tried. I have always considered galls (on *plaster* lands) more effectually operated upon by this manure than are the *unworn* lands adjoining. This observation was first made by me in Curles' Neck, and I doubt not I shall be borne out in it by one of the *fathers* of the plaster system in Virginia—our highly estimable friend, J. G. M****. As I generally graze partially after the 20th of June, and cut over some of the richer portions of the clover field—having attained the objects sought in ensuring the life of the *young* crop and a fair return of the old, by the first application, I am unwilling to stimulate *too* highly by the use of plaster on old clover—and afterwards to rob the land of every (not "*spice*," Mr. Editor, but) *spire* of grass. But let me not be drawn into an exposition of my theory (if I have one) on the long mooted point—the *modus operandi* of plaster. Suffice it for *me*, that it is to the farmer, as calomel to the empiric—a Sampson—that invigorates and cures—*but not one* which prostrates and *kills*. Unless as under the management of the quack (a character by *the way*, not confined to the medical profession) the system is first stimulated to exuberance—then depleted to death!

In any future communication to your journal, to which I acknowledge my duty as a member of the farming fraternity to contribute, however lamely, I will comply with your *reasonable* request, by giving for what it may be worth, my proper signature, though for this occasion must still be permitted to use that of

RIVANNA.

[In the foregoing communication, our correspondent and friend has adroitly contrived to bring to notice, and correct sundry typographical errors, under which his former piece, (in No. 9, at page 554,) was a sufferer to an extent very unusual in the Farmers' Register. On this account, we have thought it but just to give his continuation a place in this number, though it arrived too late for insertion, if it had been made to wait for its regular turn. In decyphering this, we hope to have been more successful, as no pains have been spared for that purpose.]

SUSPENSION OF THE PUBLICATION OF THE LIST OF PATENTS.

The following notification, from the Journal of the Franklin Institute, will serve to account from the suspension of our publication of patents for implements for agriculture and economical uses. When the general publication is resumed in that work, our partial extracts thence will also be recommenced. But it is expected, and hoped, that the lists hereafter will be much shorter, on account of the new patent law operating to prevent the issuing of patents for the much the greater part of what are called *inventions*, and *improvements*, but which in fact are neither *new* nor *useful*.

"Our readers need not be informed of the great national loss consequent upon the burning of the Patent Office, a circumstance which will materially influence, for a time at least, the contents of this Journal. The editor resides in the vicinity of that office, and his danger from the fire was imminent; but his dwelling, with his books and papers, were preserved, although with some disarrangement of the latter; his papers and notes relating to patents were, however, in a desk in the Patent Office, and of course, shared the general fate of its contents. On the first moment of alarm all access to that office was rendered impracticable from the dense smoke with which its stair, case and passages were filled, even before the fire was visible. The monthly list of patents, with the editor's remarks, must, at present, be discontinued, but they will be resumed in due season, after the necessary progress has been made in the business of the office."—*Jour. Fra. Inst.*

For the Farmers' Register.

COMMERCIAL REPORT.

This has been the most gloomy month we have witnessed in several years. The consequences which have been for some time apprehended from the deranged state of the money market, and of domestic exchanges, begin to be realized.

There is a contrivance in machinery called "the governor," whose sole operation is to regulate the power and consequent motions of the other parts checking or increasing them, so that no excessive impetus shall be given, nor any deficiency of action occur.

In our commercial and monetary system, a similar power was many years ago found necessary, and was introduced. Its efficiency was proved, and in no country was the currency and domestic exchanges more uniform than in this. It has been removed, and the state of things which existed previous to its formation has recurred.

A vast amount of bank capital has been created in some of the states, and with the increase of capital the irregularity of exchanges has increased. The temptations of large discounts and premiums induced individuals to compete with the banks for them, and successfully in so far as to obtain a considerable portion, but most unsuccessfully in the general result. The issues of paper were uncontrolled, if not unlimited, and having reached the utmost possible expansion, the inevitable consequence has ensued. Failures of a few of these large operators have occurred, exceeding in amount any thing of the kind heretofore known in this country. Millions is now a familiar term. The effect on the large stock markets was an immediate fall in prices, which on the aggregate of the stocks, amounted to several millions difference between two successive days, although the previous prices were extremely low. The current rate of interest in New York, has recently been 2, 3, even 4 per cent. per month for short periods.

To add to this disastrous state of affairs, the recent accounts from Europe are most unfavorable for our great staples, cotton and tobacco. The price of the former declined in Liverpool 1*d* the first week of February, and had previously declined nearly as much in January. The quotations of uplands, January the 1st, were 7½ to 11*d*, and the 16th of February, 6½ to 9½*d*. In our markets the price has fallen 1½ to 2 cents—but the demand is so inconsiderable, that quotations are nominal—12 to 14 may be near the mark. The receipts in the various ports of the United States, and the arrivals in Liverpool greatly exceed those of any previous year. The high prices which have ruled for some years past, will not, in all probability, be again obtained for as many years to come; and as so many things are influenced by the price of that article, a great change in them may be anticipated.

The supply of new tobacco has as yet been little more than sufficient for the home demand of our manufacturers, and prices are good compared with the value of the article abroad. Lugs $2 to $3½—inferior and common leaf $4 to $5—middling $5 to $6. Of the higher qualities none have yet been brought to market.

Flour has declined. Country brands may be quoted $9 to $10. Foreign wheat is the only sort in market. Large supplies continue to arrive in all the northern ports; but the stock in Europe is still abundant and prices in the great grain markets on the continent are lower than our farmers are accustomed to obtain in years of abundance.

X.

March 24th.

THE RECENT ENACTMENTS OF THE LEGISLATURE OF NORTH CAROLINA, IN AID OF THE IMPROVEMENT OF THAT STATE, BY RAIL ROADS, AND DRAINING THE SWAMP LANDS.

The state of North Carolina, so long taunted as the Rip Van Winkle of the confederacy, has at last been awakened—and has adopted highly important measures, and offered liberal aid, for improving the physical state of the country, and the moral and pecuniary condition of its population. It may be said, by those disposed to detract from the applause thus accorded, that it required the great and unlooked-for treasure furnished in her share of the surplus revenue of the United States, to make North Carolina commence the noble work of aiding her great improvements, and developing her great but dormant resources. This, it must be confessed, is true. Nevertheless, in thus using this chance-acquired treasure, North Carolina has shown both good sense and liberality—and *that* is no small merit, when we compare her course in this respect with such schemes as are strongly urged, and possibly may be adopted in Virginia and some other states.

Subscription to Railways.

By recent enactments, the state of North Carolina has adopted, for certain works only, the plan which has been general in Virginia, since 1816, of paying two-fifths of the expense of all such useful public improvements, by roads, railways, and canals, as shall have the remaining three-fifths paid by individual subscribers. And the great works to which this state bounty has been extended, are, the *Central Rail Road*, proposed to run from Beaufort to Fayetteville—the *Fayetteville and Western Rail Road*, (from Fayetteville to the Narrows of the Yadkin, and thence by one branch to Wilkes county, and another to join the Charleston and Cincinnati route)—and the *Wilmington and Halifax Rail Road*, which is already in progress. While heartily applauding the liberal aids offered to these works, we must also condemn the refusal to extend the like measure to the Raleigh and Gaston Rail Road and its continuation towards Columbia, both constituting a most important, and, no doubt, a most profitable part of the great northern and southern line of mail carriage and travel, which will, before long, be complete from Boston to New Orleans. Every link of this great chain, (unless requiring great expense on account of peculiar difficulties of construction, or unless very badly managed afterwards,) *must* be highly profitable to the stockholders; and therefore, these roads can, as well as any, do without the favor and co-operation of the state which were refused to them. It has indeed been supposed, that the belief in this opinion operated on a portion of the legislature to refuse aid, where it was so little wanting. But the refusal was, nevertheless, both unjust and impolitic, and will operate to injure the interests of North Carolina, putting aside the interests of her stockholders. Another and far more powerful reason for refusing to subscribe to the Raleigh and Gaston railway, was owing to a great part of that stock having been originally subscribed for, and is still held, by persons who are not residents of North Carolina—and an unwillingness to confer benefits on "foreign capitalists." It is true that North Carolina owes this first great railway that is entirely in her territory—and which has led to the success of all the other schemes now proposed—to the citizens of other states having more confidence in the value of such a work, than the government of North Carolina, or many of her citizens. To the enterprise and capital of these "foreigners" (most of whom we are proud to say, are Virginians) North Carolina will owe, not only this great source of value and profit to her agriculture, but, *indirectly*, also the establishment of her whole system of such improvements. This consideration alone would be cause enough for not discarding this road from an equal share of countenance and favor. However, we mean not to appeal to the sense of gratitude of the state, but merely to that of its interest. This road will as certainly be completed, and will yield as large dividends to the stockholders, without the aid of the state's subscription, as with it. It will have no effect whatever upon the future returns of the railway, whether the state owns two-fifths of its stock, and draws two-fifths of its profits, or that the whole of both are in the hands of private individuals. There is, however, an important difference as to the state, whose interest would have been essentially, and in various ways, promoted by her becoming a partner in the work. It is not, however, our purpose to undertake the discussion, at large, of this question of state policy.

Drainage of the Swamp Lands.

Another purpose to which North Carolina has devoted a part of the treasure recently put at her disposal, commands unmixed applause. It is the draining, and bringing into a state for culture, the immense body of swamp lands, which fortunately still belong to the commonmealth, and which, still more fortunately, she now has both the disposition and ability to bring to a state of high value.

It was not a little odd, that we had written a denunciation of the legislature of North Carolina, for their neglect of this great source of national evil, or good, (accordingly as it is managed,) not long before the passage of the act which has changed our censure to applause, and deprived us of any pretension to prophetical knowledge in this respect. The following passage was designed as part of the description of the Dismal Swamp which was published in our January number: but was omitted, as more appropriate to remarks specially on the swamp lands of North Carolina, which we hoped to be able to see, and describe, at some future time.

"The Dismal Swamp stretches southward nearly half its length into North Carolina. Indeed swamp land of the same general character, continues much farther south, and forms a large part of several counties in the eastern part of North Carolina. Of this vast southern extension it is not my purpose to speak, except to state what is derived from mere loose report —that nearly the whole region is now an enormous nuisance, and a source of wide-spread disease, poverty and desolation—and yet might be rendered, by proper drainage, with ease and cheapness, compared to the object, a region as remarkable for fertility and beauty, as it now is for the opposite qualities. Some few enlightened and spirited proprietors have executed particular works that prove these assertions by example: but unfortunately, others are slow to follow such examples—and the most slow is the commonwealth of North Carolina, which still remains the proprietor of a very large body of these rich swamp lands."

The swamp lands belonging to the state, besides all held by individuals, are supposed to amount to 1,500,000 acres. All this, in addition to other large funds, has been lately given to the Literary Fund, designed to aid general education—and $200,000 have been appropriated to be expended in draining these lands. A most magnificent and noble work indeed! which will redound to the honor of the government, and the profit of the people, if judiciously planned and executed—but which there is great reason to fear will be planned without judgment, and executed still worse than planned. The art of draining rests on scientific principles, which, however simple, cannot be neglected, or opposed, without certain disappointment, if not total failure in the objects contemplated. How few men are there who know the proper and most economical and sure modes of draining a few acres on their own farms! and how immeasurably greater will be the danger, if unfit and improper agents are trusted, of failure in this one general plan of draining a swamp equal in size to a principality!

Our presumption, in expressing these fears of mismanagement and failure, is the greater, inasmuch as we know but little of the provisions of the law, and nothing of the individuals to whom its execution will be committed. We only know that much skill, and a general knowledge of draining will be requisite, and that little of either is possessed by any in this country—and that government jobs are, of all in the world, the worst executed. Judging from the manner in which public works and important improvements are directed by government, we guess that the great work of the North Carolina drainage, will probably be confided to the direction of some highly respectable, elderly, and inert gentlemen, who however well informed otherwise, are totally ignorant of the principles of draining, and that these directors will employ, trust, and seldom supervise personally, low priced agents or contractors, ignorant in every respect, except how to make a good living for themselves out of even the lowest wages paid by the public. If we may presume not only to censure in advance, but to advise in this matter, it would be to a course like this. Let a competent engineer, as well as a scientific drainer, be employed, *at liberal salaries*, to examine the whole ground, and report upon the whole plan, before any partial commencement of *ditching* is made. Those who will successfully execute this work, must not only know all about the water, and the means to remove it, but also the *nature of the soil to be reclaimed*, its chemical ingredients, and thence, what will be its future condition, value, and *permanency* after draining, under tillage. It is not enough to know how to lower the water sufficiently, compared to the *present* height of the surface soil: it should be known whether that level of the surface will be maintained, when dry and under tillage, or whether, as in most embanked marshes in Virginia, the dried soil may not *rot away* (on account of its vegetable composition) almost to the new level of the reduced waters.

We earnestly hope that our fears of the execution of this work may prove as ill-founded, as our late prediction of the continuance of the neglect to authorize its commencement on the part of the legislature of North Carolina.

TO SUBSCRIBERS.

The increase of original communications, as exhibited in the last and present numbers, and by pieces on hand for the next, is a gratifying indication that the editor's recent appeal on that subject has not been made in vain. In addition to the communications of correspondents, such as have heretofore given its highest value to this journal, the editor designs to commence, both in person and by proxy, in a more regular and deliberate manner than at any previous time, the making of visits of inspection and inquiry to the accessible and interesting farming districts of Virginia. The few reports of this kind presented in the several volumes of the Farmers' Register, though so favorably received as to encourage renewed and better efforts, were made by the editor under great disadvantages, in the want of leisure for making such examinations with proper care, and due regard to accuracy and minuteness of the statements, on his own part—and also, for the total want of aid from other persons. It will not be his fault if the plan is not better devised, and more fully executed, for the next volume.

Taking a general average of all the subscribers to the work, their dues are so regularly and fully paid, that the editor has to apologize to the punctual, for the concise but conspicuous statement on the cover of this No. which will go to every subscriber, without exception, of the amount which he owes, to the end of Vol. 4, which this No. closes. Of course, all who continue subscribers, will owe for another volume in advance on the 1st of May, when the issuing of Vol. V will commence. Heretofore no duns have been sent to subscribers who had not been *longer* than one year in arrear of payment; and the reason for a different course now, is, that many subscribers (who perhaps never have read the conditions, and rarely see the *inside* of the publication,) require this *outside* notification of the large amount of their arrears—and that the form adopted, requires that every actual debt shall be stated. If the place for the sum is left blank, of course the subscriber (according to the account book) has paid in advance for Vol. IV, and owes nothing at this time. As some mistakes are unavoidable, and sometimes, in consequence, subscribers are either *charged* or *credited* improperly, the editor requests to be informed, should any mistakes of either kind appear, and they will be as promptly and readily corrected in the one case as in the other.

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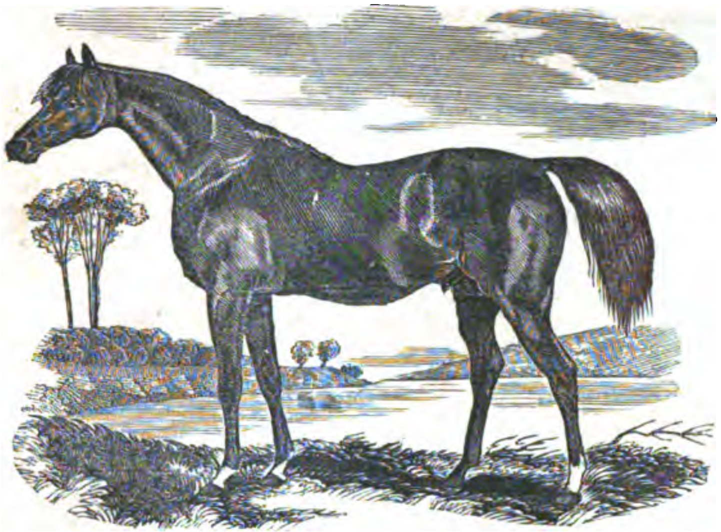
IMPORTED HORSE



SHAKSPEARE.

THIS splendid and magnificent horse, a genuine specimen of the Newmarket race horse, will make his second season in America at my stables, one mile east of Lawrenceville, in Brunswick county, Virginia. He will serve mares at $75 the season, to be discharged by the payment of $60 within the season; and $100 insurance, payable whenever it is ascertained the mare is with foal, or transferred, with $1 cash to the groom in each case. Any gentleman putting, or assuming payment for six mares, may have them served at $50 each. Good and extensive pasturage, and black servants boarded gratis, and mares will be fed with grain at 25 cents a day. Every precaution will be taken to prevent accidents or escapes, but no responsibility for any.

Shakspeare is a tried and approved stallion in England, patronized by many eminent sportsmen, as the Duke of Grafton, Mr. Wilson and others—and his colts are running with extraordinary success. He is a large brown horse, 16 hands high, with excellent action, uncommon beauty and strength, and the best constitution and temper. In these respects he is not surpassed, and probably not equalled by any horse in the United States. He is a horse of the finest form and the very highest racing character; and was not only a first rate runner himself, but what is of far more importance, his stock is first rate in England. His colts have run against the best colts and beat them, and have been frequent winners at Newmarket. To prove the value and success of his stock, it is sufficient to state that, last year, he had more two years winners, (one of which was never beaten,) than any horse in the kingdom, except Priam and Sultan, and as many as Sultan, they having the same number. On such a horse, eulogy would be misplaced.

PEDIGREE OF SHAKSPEARE.

He was got by Smolensko, winner of the Derby; his dam Charming Molly by Rubens; Comedy by Beningbrough; Mrs. Jordan by Highflyer; Harriet by Matchem; Flora by Regulus; Bartlett's Childers; Bay Bolton, &c.

For particulars, see handbills. The weather being good, an effort will be made to show him at Nottoway, Lunenburg, and Mecklenburg Courts, in March or April.

JOHN D. KIRBY.

March 1, 1837.—2t

CONDITIONS
OF THE FARMERS' REGISTER.

EDMUND RUFFIN, *Editor and Proprietor.*

1. The Farmers' Register is published in monthly numbers, of 64 large octavo pages each, and neatly covered, at $5 a year—payable in advance.

2. Or five *new* subscribers by sending their names and $20 at one time to the editor, will receive their copies for one year, for that sum, or at $4 for each. Purchasers of any 5 volumes (except Vol. 1.) at one time in like manner, shall have them for $20.

3. The risk of loss of payments for subscriptions, which have been properly committed to the mail, or to the hands of a postmaster, is assumed by the editor. *All mail payments must be made in notes or checks of par value in Virginia.*

4 For all copies not received by mail, at the proper post offices, duplicates will be furnished to those subscribers who have complied with their own obligations.

5. If a subscription is not directed to be discontinued before the first number of the next volume has been published, it will be taken as a continuance for another year. Subscriptions must commence with the beginning of some volume, and will not be taken for less than a year's publication.

6. The mutual obligations of the publisher and subscriber, for the year, are fully incurred as soon as the

first number of the volume is issued: and after that time, no discontinuance of a subscription will be permitted. Nor will a subscription be discontinued for any earlier notice, while any thing thereon remains due, unless at the option of the editor.

Additional articles for the future Volumes.

7. Any five *old* subscribers, by paying (for any volume) $20 *directly to the editor at any one time before the issue of No. 2, of that volume,* (which will be on June 1st) *and without causing any charge for postage or agency,* shall be credited for their five copies for the year so paid for—thus reducing the price to $4 for each. This privilege of course ceases for each volume, as soon as its 2nd number is issued.

8. Any postmaster who distributes to subscribers at his office 10 or more copies of the Farmers' Register, and will collect and transmit free of postage the payments, as collected, of not fewer than 10 subscribers, shall be furnished with the Nos. of the current volume, or, at his choice, a bound copy of a previous volume. In such cases, the name and payment of every *new* subscriber obtained by the postmaster, will be counted in the allowance of compensation, as equal to two old ones. But, of course, the deduction from the regular price of $5 is in no case to be made to both subscriber and collector.

9. Postmasters, or other persons, may avail themselves of either of the different advantages offered above for obtaining subscribers and collecting payments. But it must be understood in all such cases, that the person so acting *is not the agent of the editor*, but merely of the subscriber for whom he is acting: nor will the editor bear the loss of any payments so made, unless of sums proved to have been properly committed to the mail.

Editor's Address— Edmund Ruffin, *Petersburg, Va.*

PRICES CURRENT.—March 27, 1837.

PRICES OF STOCKS.	Par value.	Offered.	Asked.	Last sales.	Last dividend for 6 months.
BANK—Virginia—per share, - -	100				5
Farmers', - - - - -	100				4½
RAIL ROAD—Petersburg and Roanoke,	100	110	110	110	5
Portsmouth and Roanoke,	50			40	Unfinished
Chesterfield, ($53 of capital refunded,) - -	100		no sales		
Richmond & Fredericksburg,	100				
Greensville & Roanoke, (both new and old stock.)	100	108	109	109	do.
Raleigh and Gaston, -					
Richmond and Petersburg,	100				do.
MANUFACTURING COMPANIES.					
Petersburg Cotton Manufactory, - -	100	130		125	10
Merchants' Do. old stock, -	100	150	155	150	12
Matoaca Do. - - - -	100	140		135	7½
Do Do new stock, -	100	125			
Ettricks Do. - - - -	100	115		115	
Fleet's Do. - - - -	100		105	105	
INSURANCE COMPANIES.					
Petersburg, Fire and Marine, - -	100	111		111	10½

EXCHANGE on England, - - - - - 11 per cent.

COUNTRY PRODUCE.

Wheat, red, (none in market)	$1 50 to 2 00	Cotton, - - - - - -	$0 11 to 0 12
white, do. do.		Tobacco, old, none in market.	
Flour, superfine (country,) new	10 00	Do new, *for manufacturing.*	4 00 to 5 00
City and family -	11 00 to 12 50	Do Do lugs.	2 00 to 2 50
Corn per bushel, - -	0 90 to 0 95	Bacon (hog round) Virginia,	0 13 to 0 15

☞ In the present state of markets, it is scarcely possible to state prices truly; and sundry blanks are left in this report, rather than to risk stating errors. See Commercial Report at page 766.

TO CORRESPONDENTS AND READERS.

The following communications are on hand, and will appear in No. 1 of Vol. V.—"*Account of the Greensville and Roanoke Rail Road*"—"*Unsuitableness of cotton culture for lands designed to be improved, &c.*"—"*On the advantages found in substituting canals for mill-ponds, in Charlotte*"—"*Value and product of the* [illegible]"—"*Management of slaves*"—"*Abutments of bridges*"—

AN APPRENTICE WANTED.

A BOY of 13 or 14 years old, of good habits and respectable connexions, and sufficiently acquainted with spelling and reading for the purposes required, will be received as an apprentice to the printer's trade, at the Office of the Farmers' Register. EDMUND RUFFIN.